MASTER OF SCIENCE IN EPIDEMIOLOGY AND APPLIED HEALTH RESEARCH, CONCENTRATION IN HEALTH TECHNOLOGY ASSESSMENT

Overview

Summary

- Degree offered: Master of Science (MSc) Epidemiology and Applied Health Research, Concentration in Health Technology Assessment
- Registration status option: Full-time
- Language of instruction: English
- Program options (expected duration of the program):
  - with thesis (6 full-time terms; 24 consecutive months)
  - with research paper (4 full-time terms; 16 consecutive months)
- Academic units: Faculty of Medicine (http://med.uottawa.ca/en/), School of Epidemiology and Public Health (http://med.uottawa.ca/epidemiology/).

Program Description

The purpose of the program is to provide a scholarly environment for the health sciences community that will stimulate and enhance learning and expand knowledge by conducting research.

The objective of this pathway is to impart knowledge and to develop critical thinking, research specific skills and communication skills in Health Technology Assessment.

Graduates are professional experts or consultants who can advise persons and agencies in other fields.

Main Areas of Research

The faculty members of the School come from a wide variety of academic backgrounds and interests. The School has an active research program, involving extensive collaborations with other groups. Active areas of research include: biostatistics, clinical research, epidemiology, global health research, health technology assessment, health policy research, and implementation science.

Other Programs Offered Within the Same Discipline or in a Related Area

- Master of Science Epidemiology and Applied Health Research (MSc), Concentration in Epidemiology
- Master of Science Epidemiology and Applied Health Research (MSc), Concentration in Global Health Research
- Master of Science Epidemiology and Applied Health Research (MSc), Concentration in Health Policy
- Master of Science Epidemiology and Applied Health Research (MSc), Concentration in Clinical Research
- Master of Science Epidemiology and Applied Health Research (MSc), Concentration in Implementation Science
- Doctorate in Philosophy Epidemiology, and Applied Health Research (PhD)

Fees and Funding

- Program fees:

  The estimated amount for university fees (https://www.uottawa.ca/university-fees/) associated with this program are available under the section Finance your studies (http://www.uottawa.ca/graduate-studies/programs-admission/finance-studies/).

  International students enrolled in a French-language program of study may be eligible for a differential tuition fee exemption (https://www.uottawa.ca/university-fees/differential-tuition-fee-exemption/).

- To learn about possibilities for financing your graduate studies, consult the Awards and financial support (https://www.uottawa.ca/graduate-studies/students/awards/) section.

Notes

- Programs are governed by the academic regulations (http://www.uottawa.ca/graduate-studies/students/general-regulations/)in effect for graduate studies.
- In accordance with the University of Ottawa regulation, students have the right to complete their assignments, examinations, research papers, and theses in French or in English.

Program Contact Information

Graduate Studies Office, Faculty of Medicine (https://med.uottawa.ca/graduate-postdoctoral/)

451 Smyth Road, Room RGN 2016

Ottawa, Ontario, Canada

K1N 6N5

Tel.: 613-562-5215

Email: grad.med@uottawa.ca

Youtube | Faculty of Medicine (https://www.youtube.com/channel/UCP2nDlrjFEEtyfMiOmle2HA/)

Flickr | Faculty of Medicine (https://www.flickr.com/photos/uottawamed/)

Admissions Requirements

For the most accurate and up to date information on application deadlines, language tests and other admission requirements, please visit the specific requirements (https://www.uottawa.ca/graduate-studies/programs-admission/apply/specific-requirements/) webpage.

To be eligible, candidates must:

- Have one of the following:
  - An honours bachelor of science degree with specialization with a minimum average of B+.
  - An honours bachelor of science degree with a major in a discipline relevant to health research (e.g. epidemiology, health sciences, health policy, behavioral sciences, social sciences with a minimum average of B+.

- A four-year degree in a health profession (medicine, nursing, rehabilitation therapy etc.) with a minimum average of B+.

  Note: International candidates must check the admission equivalencies (https://www.uottawa.ca/graduate-studies/international/study-uottawa/admission-equivalencies/) for the diploma they received in their country of origin.

- Demonstrate a good academic performance in previous studies as shown by official transcripts, research reports, abstracts or any other documents demonstrating research skills.

Language Requirements

Applicants must be able to understand, write and fluently speak the language of instruction (English) in the program to which they are applying. Proof of linguistic proficiency may be required.

Applicants whose first language is neither French nor English must provide proof of proficiency in the language of instruction.

Note: Candidates are responsible for any fees associated with the language tests.

Notes

- The admission requirements listed above are minimum requirements and do not guarantee admission to the program.
- Admissions are governed by the academic regulations (https://www.uottawa.ca/about-us/leadership-governance/policies-regulations/) in effect for graduate studies.

Program Requirements
Master's with Thesis

Students must meet the following requirements:

Compulsory Courses		
EPI 5188	Health Technology Assessment	3 Units
EPI 5189	Health Economic Evaluation	3 Units
EPI 5240	Epidemiology I	3 Units
EPI 5242	Biostatistics I	3 Units
EPI 6276	Biostatistics II	3 Units
MED 8166	Professionalism and Professional Skills	
Optional Courses		
6 optional course credits from:		6 Units
EPI 5103	Health Policy I	
EPI 6178	Health Intervention Designs I	
EPI 6188	Systematic Review and Meta- Analysis	
EPI 7189	Advanced Health Economic Evaluation	
Seminar		
EPI 5366	MSc Seminar [1]	
Thesis		
THM 7999	Master's Thesis [2]	

Note(s)

[1] Participation in approved departmental seminars (bi-weekly community medicine rounds, weekly clinical epidemiology rounds or other approved seminars organized by the Department) is compulsory.

[2] Students are responsible for ensuring they have met all of the thesis requirements.

Master's with Research Project

Students must meet the following requirements:

Compulsory Courses		
EPI 5188	Health Technology Assessment	3 Units
EPI 5189	Health Economic Evaluation	3 Units
EPI 5240	Epidemiology I	3 Units
EPI 5242	Biostatistics I	3 Units
EPI 6276	Biostatistics II	3 Units
MED 8166	Professionalism and Professional Skills	
Optional Courses		
9 optional course credits from:		9 Units
EPI 5103	Health Policy I	
EPI 6178	Health Intervention Designs I	
EPI 6188	Systematic Review and Meta- Analysis	
EPI 7189	Advanced Health Economic Evaluation	
Elective Courses		
3 elective course credits in epidemiology (EPI) or Public Health (PBH) at the graduate level [1]		3 Units
Seminar		
EPI 5366	MSc Seminar [2]	
Research Project		
EPI 7998	Research Project	6 Units

Note(s)

[1] The elective course units may also be selected from graduate courses offered by other departments with the approval of the Epidemiology and Applied Health Research Graduate Studies Committee.

[2] Participation in approved departmental seminars (bi-weekly community medicine rounds, weekly clinical epidemiology rounds or other approved seminars organized by the Department) is compulsory.

Fast-Track from Master's to PhD

Students enrolled in the master's program in Epidemiology, and Applied Health Research in the thesis orientation at the University of Ottawa may be eligible to fast- track directly into the doctoral program without writing a master's thesis. For additional information, please consult the "Admission Requirements" section of the PhD program.

Research
Research at the University of Ottawa

Located in the heart of Canada's capital, a few steps away from Parliament Hill, the University of Ottawa ranks among Canada's top 10 research universities. Our research is founded on excellence, relevance and impact and is conducted in a spirit of equity, diversity and inclusion.

Our research community thrives in four strategic areas:

- Creating a sustainable environment
- Advancing just societies

- Shaping the digital world
- Enabling lifelong health and wellness

From advancing healthcare solutions to tackling global challenges like climate change, the University of Ottawa's researchers are at the forefront of innovation, making significant contributions to society and beyond.

Research at the Faculty of Medicine

"The Faculty of Medicine has a long history of conducting both basic and clinical research of the highest quality. Many of our high profile research projects are conducted in partnership with affiliated-teaching hospitals and research institutes. These partnerships lead to biomedical discoveries that have a significant impact on health care. In the process they educate the next generation of Canadian scientists. Our research activity also attracts significant investment, which stimulates the Ottawa economy."

- Dr. Bernard Jasmin, Vice-Dean, Research

Facilities, Research Centres and Institutes at the Faculty of Medicine

- Centre for Neural Dynamics (https://neurodynamic.uottawa.ca/)
- University of Ottawa Centre for Neuromuscular Disease (http://med.uottawa.ca/neuromuscular/)
- Centre for Research in Biopharmaceuticals and Biotechnology (http://www.med.uottawa.ca/crbb/eng/)
- Canadian Partnership for Stroke Recovery (https://canadianstroke.ca/)
- Kidney Research Centre (http://www.ohri.ca/centres/KRC/default.asp)
- University of Ottawa Skills and Simulation Centre (http://uossc.ca/)
- Medical Devices Innovation Institute
- Ottawa Institute of Systems Biology (http://med.uottawa.ca/oisb/)
- University of Ottawa Brain and Mind Research Institute (http://www.uottawa.ca/brain/)

For more information, refer to the list of faculty members and their research fields on **Uniweb**.

IMPORTANT: Candidates and students looking for professors to supervise their thesis or research project can also consult the website of the faculty or department (https://www.uottawa.ca/study/graduate-studies/academic-unit-contact-information/) of their program of choice. Uniweb does not list all professors authorized to supervise research projects at the University of Ottawa.

Courses

Not all of the listed courses are given each year. The course is offered in the language in which it is described.

EPI 5101 Applied Biostatistics Lab (1.5 units)

In this course, students will apply the concepts learned in PBH 5107. Students will be introduced to statistical programming and they analyze data sets.
Course Component: Seminar
EPI 5101 is corequisite to PBH 5107.

EPI 5102 Qualitative Research Methods (3 units)

This course will examine theoretical frameworks and corresponding methods of qualitative research. Topics will include: theoretical paradigms of qualitative research; matching qualitative research to types of research questions; sampling objectives and procedures; methods of data collection; analysis and interpretation; quality criteria for evaluating qualitative research studies; ethical issues and responsibilities of qualitative researchers. Relationship between qualitative and quantitative research will be explored.
Course Component: Lecture
Prerequisite or corequisite: EPI 5240.

EPI 5103 Health Policy I (3 units)

Exploration of the breadth of health policy issues within Canada and globally with an emphasis on public health policies. Topics covered: the policy process and models that can be used to understand health policy, the development of evidence-informed health policy, the ethics behind health policies, health policy analysis, evaluation, and implementation and how to influence health policies.
Course Component: Lecture

EPI 5126 Introduction to Healthcare Epidemiology (3 units)

Applications of epidemiologic and statistical methods within the healthcare setting; issues specific to infection control; roles and administration of infection control, risk management and quality assurance within healthcare facilities; surveillance mechanisms for nosocomial infections; outbreak investigation methods; infection risks in special populations and settings; prevention and risk management of adverse outcomes; regulatory guidelines and accreditation; emerging issues in infection control.
Course Component: Lecture

EPI 5142 Health Services Evaluation (3 units)

The theory and practice of health services evaluation, including specification of objectives, research designs, measures of process and outcome, and practical problems in conducting evaluations. The focus is on scientific (research) evaluation, but other evaluation strategies and techniques are discussed. Lectures and student presentations.
Course Component: Lecture
Prerequisite: EPI 5240 or equivalent and permission of instructor.

EPI 5143 Epidemiological Research Using Large Databases (3 units)

A practical approach to using administrative and other large databases for epidemiological research. Basic and advanced data science and statistical approaches to manipulate, link, and explore relational databases; coding systems, data warehouses; disease, drug, and health intervention coding systems; data quality and sources of bias in health administrative databases; concepts of open science, reproductible research, transparent reporting, and the importance of validation.; Extensive use of SAS and R as the primary analytical packages, but with an emphasis on generally applicable concepts and algorithms.
Course Component: Lecture
Prerequisites: EPI 5240, (EPI 5242 or MAT 5375).

EPI 5144 Global Health Epidemiology and Practice (3 units)

This course weaves a critical discussion of power asymmetry in global health and decolonization through key concepts in global health including: global burden of illness; epidemiology of major infectious and non-communicable diseases; global environmental health; maternal and child health, global nutrition, one health. Global health practice, humanitarian crises in global health, research methods, community engagement, systematic reviews, knowledge translation, communication, ethics, collaboration, funding, sustainability, publication, evaluation, and evidence for global health action are all covered through a global health lens.

Course Component: Lecture

EPI 5145 Climate Change and Health (3 units)

In this course students will learn about the multidimensional impacts of climate change on human health, exploring the pathways linking climate change drivers and hazards, population vulnerabilities and exposures, and population health outcomes. Students will participate in lectures, case studies and presentations to investigate how climate change adaptation and mitigation strategies can help to prevent or reduce the health impacts of climate change, and the roles of public health practitioners, researchers, and international organizations.

Course Component: Lecture

EPI 5180 Health Systems and Global Governance (3 units)

The purpose of this course is to introduce students to the context and reality of health systems and global governance, to new and emerging issues in global health, to the impact of and interaction of health with social determinants, and to sectoral, national and foreign policies on health. The course is part of the graduate level global health stream however it is also expected to interest those who wish to take this course as a standalone course to prepare for global health and development assignments or employment. Seminar presentation required.

Course Component: Lecture

EPI 5181 Population Health Risk Assessment I (3 units)

National and international policy frameworks for health risk assessment and management, including determinants of population health; epidemiological, clinical, and toxicological methods for identifying health hazards; population health surveillance; methods of population health risk assessment; regulatory, economic, advisory, and technological approaches to population health risk management; community action and social marketing; selection of risk management strategies; risk perception and risk communication. Lectures and case studies. Preparation of term paper on a current issue in population health risk assessment.

Course Component: Lecture

EPI 5240, (EPI 5242 or MAT 5375) are corequisites to EPI 5181. Courses EPI 5181, PHR 5181 cannot be combined for units.

EPI 5182 Sample Survey Research Methods (3 units)

Comprehensive review of the use of sample surveys in epidemiologic research. Sampling designs and methods. Simple random samples and stratified samples. Multi-stage sampling. Other complex survey designs. Cluster sampling and sample weights. Response and non-response biases. Questionnaire design. Analysis of survey data. Ethics in surveys. Practical issues in surveys. Pre-requisite: Basic understanding of statistical methods and epidemiologic principles.

Course Component: Lecture

EPI 5183 Approaches to Community Public Health Program Evaluation (3 units)

Critical review and practical application, in collaboration with a health care community partner, of approaches to community and public health program evaluation. Community partners include representatives of the community agencies whose mandate or remit includes evaluation of their community/public health program(s). On course completion, students should be able to (a) identify most appropriate approaches to evaluation, (b) critically review strengths and limitations of chosen approaches, (c) apply the selected approach appropriately to examine and quantify impact of the program(s), (d)critically evaluate existing evaluations and identify strengths and limitations.

Course Component: Lecture

EPI 5188 Health Technology Assessment (3 units)

Definition and scope of health technology assessment (HTA); topics related to the completion of HTA, including an understanding of the Canadian and global HTA landscape, systematic reviews and meta-analysis, economic evaluation, consideration of ethical, legal, and social issues, and knowledge translation/mobilization. Lectures, seminars and case studies.

Course Component: Lecture

EPI 5189 Health Economic Evaluation (3 units)

Brief overview of economics and health economics; examination of analyses used in epidemiologic and clinical research: cost-effectiveness analysis, cost-minimization analysis, cost-utility analysis (including determination of utilities), cost-benefit analysis, and use of economic methods in priority-setting. Lectures and seminars. Written report required, presenting a proposal for an economic evaluation.

Course Component: Lecture

EPI 5210 Public Health Governance (3 units)

Introduction to public health governance including the main institutions of global public health as well as federal and provincial public health institutions. Introduction to the governance and management of public health units in Ontario. Lectures, presentations by invited experts, and student presentations.

Course Component: Lecture

EPI 5211 Environmental and Occupational Health (3 units)

This course will familiarize students with the extent and mode of action of environmental influences on health, and with epidemiologic and regulatory methods used in environmental and occupational health. It is intended primarily for M.Sc. students in epidemiology and residents in community medicine. Lectures, presentations by invited experts, case studies, seminar presentations by students.

Course Component: Lecture

EPI 5212 Communicable Disease Epidemiology (3 units)

This graduate-level course provides an introduction to the epidemiology and characteristics of major infectious agents and communicable diseases, the determinants and mechanisms of disease transmission, the principles of outbreak investigation, and the research strategies for obtaining and evaluating evidence to improve relevant public health outcomes. Emphasis will be placed on practical applications of theoretical concepts pertaining to communicable disease prevention and control.

Course Component: Lecture

EPI 5240 Epidemiology I (3 units)

This course provides a broad introduction to epidemiology covering its history and uses, disease frequency and impact, outbreak investigation, screening, study design, measures of association, confounding and effect modification, bias, and causation. Material is taught using lectures and small group assignments.

Course Component: Lecture

Prerequisite or corequisite: EPI 5242 or PBH 5107.

EPI 5241 Epidemiology II (3 units)

This second level epidemiology course covers major principles of study design and analysis, such as exposure and outcome measures, measures of association, study validity and precision, confounding and effect modification, stratified analysis, regression models, bias analysis, and analytical strategy. The course also covers some specific topics such as complex survey data analysis, relative risk estimation in multivariate analysis (log-binomial and modified Poisson regression models), and combined effect of multiple exposures and biologic/public health interaction assessment. Material presented in a quantitative manner.

Course Component: Lecture

Prerequisites: EPI 5240, EPI 5242.

EPI 5242 Biostatistics I (3 units)

This course first introduces fundamentals of probability and methods of exploring, organizing, and presenting data before discussing foundations of statistical inference. These include concepts of population, sample, parameter, and estimate, and the use of likelihood functions, confidence intervals, and hypothesis tests. Parametric and non-parametric statistical methods are then presented for comparing two groups and multiple groups (ANOVA). Measures of association and simple linear regression are also introduced. Topics are covered in the context of epidemiological study designs and incorporates some concepts involved in planning a study (e.g., stratification, sampling strategies, and sample size). At least one statistical software is introduced (SAS, STATA, R), to manipulate data and conduct the basic statistical inference methods learned in the course.

Course Component: Lecture

EPI 5244 Special Topics in Epidemiology (3 units)

The content of this seminar course is flexible, covering issues of current debate in communicable and non-communicable disease epidemiology. Presentations by participants and invited experts and seminar discussion.

Course Component: Lecture

EPI 5251 Measurement in Health (3 units)

An overview of measurement theory as applied to health measurement; a review of existing measurements of health status in clinical and research applications, plus practical experience of how to develop and test new measurement methods.

Course Component: Lecture

EPI 5271 Health Promotion (3 units)

Origins, theories and techniques of health promotion at the individual and community levels. Examination of current health promotion activities in Canada and elsewhere.

Course Component: Lecture

EPI 5342 Genetic Epidemiology I (1.5 units)

Scope of genetic epidemiology, including an overview of types of human genetic variation, approaches to gene discovery vs. gene characterization. Specific issues include: assessment of effect of family history on disease risk; measurement of genetic variation, genotyping errors and factors affecting these; study designs specially adapted to genetic epidemiology family based designs (e.g. case-parent trio, case-sib designs), case-only designs; candidate gene and genome-wide association approaches to genetic association; gene-environment and gene-gene interaction; integration of evidence; evaluation of potential value of genetic information in screening (e.g. newborn screening), family history tools and genetic testing.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 5343 Outcome Measures in Health Research (1.5 units)

Technical review of the design requirements for outcome measures in health research and clinical trials; a historical review of the evolution of such measures and a survey of the quality of existing instruments in various fields of health research (disability, quality of life, mental health, pain, etc.). This course is designed for students who will need to use and interpret health measures in their research.

Course Component: Lecture

Prerequisites: EPI5240, EPI5242.

EPI 5344 Survival Analysis in the Health Sciences (1.5 units)

Exploration of methods for the analysis of data which includes information about the time when an event occurred. Non-regression methods of analyzing survival data, including actuarial life tables, the Kaplan-Meier method, the log-rank test, and person-time. The hazard curve and its links to incidence rate/density. Proportional hazards regression modelling (Cox modelling) including interpretation of model parameters, model building strategies and assessing the fit of the model. Methods to handle time varying covariates and non-proportional hazards will be discussed. Classes will include hands-on modeling examples using SAS statistical software.

Course Component: Lecture

Prerequisite: EPI 5242.

EPI 5345 Applied Logistic Regression (1.5 units)

Foundation of model estimation: maximum likelihood; modeling dichotomous outcome (dependent) variables: logistic regression; logistic models with several independent variables; interpretation of model parameters; model-building strategies; assessing the fit of the model; regression diagnostics. Classes will include hands-on modeling examples using SAS statistical software.

Course Component: Lecture

Prerequisite: EPI 5242. Courses EPI 5345 and EPI 6276 cannot be combined for units.

EPI 5346 Applied Longitudinal and Clustered Data Analysis (1.5 units)

Introduction to longitudinal (repeated measures) and clustered data and overview of regression models for correlated data; linear mixed effects models: modelling the mean; modelling the covariance structure; generalized estimating equations and generalized linear mixed effects models; regression diagnostics; missing data and drop-out; case studies. Classes will include hands-on modeling examples using SAS statistical software.

Course Component: Lecture

Prerequisite: EPI 5242. Courses EPI 5346 and EPI 6276 cannot be combined for units.

EPI 5347 STATA FOR EPIDEMIOLOGICAL ANALYSIS (1.5 units)

This course will provide a basic introduction to the statistical software STATA. Each session will consist of a lecture and a lab component in which students will get to analyze a dataset under the supervision of the instructor. The course will cover basic commands, data management, graphs, data manipulation, descriptive statistics, and sample size/power calculations. More advanced topics may be covered as well. Students will need to purchase their own version of STATA.

Course Component: Lecture

Prerequisites: EPI 5240, EPI 5242.

EPI 5366 MSc Seminar

Seminars on topics in health research delivered by program faculty, visiting speakers and/or students. Compulsory attendance and participation during at least the first year of registration in the program. Graded S (Satisfactory) / NS (Not satisfactory).

Course Component: Seminar

EPI 5544 Épidémiologie et pratique de la santé mondiale (3 crédits)

Le fardeau mondial de la maladie; l'épidémiologie des principales maladies infectieuses et non transmissibles; la santé environnementale, les maladies maternelles et infantiles, la nutrition à l'échelle mondiale, l'approche une santé. La pratique en matière de santé mondiale, les méthodes de recherche, les examens systématiques, la transmission du savoir, la communication, l'éthique, la collaboration, le financement, la durabilité, la publication de la recherche, l'évaluation et les données probantes pour l'action en santé mondiale.

Volet : Cours magistral

EPI 5545 Changements climatiques et santé (3 crédits)

Ce cours permet aux étudiants de se familiariser avec les impacts multidimensionnels du changement climatique sur la santé humaine, en explorant les liens entre les facteurs et les dangers du changement climatique, les vulnérabilités et les expositions de la population, et les retombées sur la santé de la population. Les étudiants participeront à des conférences, des études de cas et des présentations pour examiner en quoi les stratégies d'adaptation et d'atténuation du changement climatique peuvent contribuer à prévenir ou à réduire les effets du changement climatique sur la santé, ainsi que le rôle des praticiens de la santé publique, des chercheurs et des organisations internationales.

Volet : Cours magistral

EPI 5642 Biostatistique I (3 crédits)

En misant sur les connaissances préalables en statistique des étudiants, ce cours examine l'application des modèles mathématiques dans l'analyse de données statistiques. Parmi les sujets à traiter : analyse de données catégoriques, choix de modèles linéaires ou non linéaires, estimation des paramètres, tests d'hypothèses par méthodes paramétriques ou non paramétriques, analyse de la variance, modèles de régression linéaire et logistique, et introduction à l'analyse de survie.

Volet : Cours magistral

Permission du Département est requise.

EPI 6101 An Introduction to Machine Learning (3 units)

An introduction to machine learning techniques and their applications on different types of health datasets. The focus is applied, emphasizing practical methods and heuristics for rigorous analysis and interpretable results. Topics include coding, training, tuning, evaluating, and interpreting decision trees, bagging, boosting, and artificial neural networks. Lectures and programming assignments.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 6126 Advanced Healthcare Epidemiology (3 units)

Exploration of advanced healthcare epidemiology topics including pandemic planning, emergency preparedness, environmental considerations, healthcare surveillance techniques, quality improvement and patient safety initiatives, antimicrobial control programs, blood safety, developing and delivering educational programs, healthcare organization and administration, healthcare epidemiology research design. Lectures, presentations by invited experts, workshops and student presentations.

Course Component: Lecture

Prerequisites: EPI 5240, EPI5126.

EPI 6178 Health Intervention Designs I (3 units)

Practical introduction to intervention studies in the health field, including experimental and quasi-experimental studies and clinical and community trials. Question formulation; conduct of literature reviews; design issues (choice of research design and study population, implications for validity of results); ethical issues; instrument development; data collection and management; approach to data analysis; report writing and presentation. Examples drawn from both population and clinical research. Development and presentation of proposal for an intervention study.

Course Component: Lecture

EPI 6181 Social Aspects of Epidemiology (3 units)

This course will analyze the way in which behavioural, social and emotional forces influence patterns of disease. The links between these processes and physiological changes; inferences on how best to intervene to modify "lifestyle" risk factors; recent prevention and health promotion trials will be reviewed.

Course Component: Lecture

EPI 6182 Population Health Risk Assessment II (3 units)

Scientific methods for population health risk assessment; characterization of population health risks, and attendant uncertainties; risk modeling; combining risk information from different sources; risk acceptability; principles of risk management decision making; evidence-based risk management policy development; audit and evaluation of risk interventions; priority setting; case studies on current population health risk assessment issues. Term paper on a current methodological issue in population health risk assessment required.

Course Component: Lecture

Prerequisite: EPI 5181. The courses EPI 6182, PHR 6182 cannot be combined for credit.

EPI 6188 Systematic Review and Meta- Analysis (3 units)

Approaches to the systematic review of evidence in the health sciences. Searching for the evidence, selection of studies, quality and validity of included studies, heterogeneity, statistical analysis and other quantitative and qualitative methods. Students will be required to do a group meta-analysis on a topic of their own interest.

Course Component: Lecture

Prerequisites: (EPI 5240 or PBH 5106), (EPI 5242 or MAT 5375 or PBH 5107).

EPI 6189 Clinical Decision Making (3 units)

Theories of decision making and their validity in health care applications. Comparison of decision support methods: decision analysis, utility assessment techniques, patient aids, practice guidelines, care maps. Methods for developing, evaluating, and disseminating decision support tools in clinical practice.

Course Component: Lecture

Prerequisites: EPI 5240, (EPI 5242 or MAT 5375).

EPI 6276 Biostatistics II (3 units)

This course introduces the use of generalized linear models for data analysis in epidemiology. Specific models covered include multivariable linear, logistic, Poisson and Cox regression models. Concepts and steps required to conduct, interpret and report valid multivariable statistical modeling are discussed. These include assessing the model fit and selecting an optimal model in the context of a specific inferential goal. Students practice multivariable modeling with at least one statistical software (SAS, STATA, R).

Course Component: Lecture

Prerequisite: EPI 5242.

EPI 6278 Health Intervention Designs II (3 units)

Lectures and laboratories on the detailed principles, design, methodology and statistical techniques associated with health intervention studies. Emphasis on emerging topics and procedures.

Course Component: Lecture

Prerequisite: EPI 6178.

EPI 6283 Pharmaco Epidemiology (3 units)

Issues in and methodology of pharmacoepidemiology. Discussion on the biases and confounders possible at every stage of a pharmacoepidemiological study, in drug utilization review, drug effectiveness, risk/benefit assessment and other topics. This course will normally be given every second year.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 6344 Current Issues in Health Research (1.5 units)

Topics will be selected based on student and faculty interests. Depending on the topics, the course may be given as formal lectures or in seminar format with presentations by participants and invited experts followed by in-class discussion.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 6345 Introduction to Implementation Science in Health Research (3 units)

The foundations of implementation science and practice including problem formation, critical appraisal of evidence, analysis of context, barrier analysis, solution design, and evaluation, spread and sustainability.

Course Component: Lecture

EPI 6581 Aspects sociaux de l'épidémiologie (3 crédits)

Ce cours analysera la manière dont les forces comportementales, sociales et émotionnelles influencent les schémas de maladie. Les liens entre ces processus et les changements physiologiques, les conclusions sur la meilleure façon d'intervenir pour modifier les facteurs de risque liés au « style de vie », les essais récents en matière de prévention et de promotion de la santé seront passés en revue.

Volet : Cours magistral

EPI 6744 Enjeux actuels de la recherche en santé (1.5 crédits)

Thèmes choisis en fonction de l'intérêt des étudiants et du professeur. Selon le thème, les séances pourront être organisées sous forme de cours magistral ou de séminaire durant lequel des présentations de participants et d'experts invités sont suivies de discussions de groupe.

Volet : Cours magistral

Préalable : EPI 5240.

EPI 6745 Introduction à la science de la mise en œuvre dans la recherche en santé (3 crédits)

Les fondements de la science et de la pratique de la mise en œuvre, y compris la formation des problèmes, l'évaluation critique des preuves, l'analyse du contexte, l'analyse des obstacles, la conception de solutions et l'évaluation, la dispersion et la durabilité.

Volet : Cours magistral

EPI 7101 Genetic Epidemiology (3 units)

Application of genetic biological methods to epidemiological research. Covers the development of research hypotheses; genetic determinants and gene-environment interactions; biomarkers for exposure and outcome as well as for predicting prognosis. Students will undertake a course project to design a genetic epidemiological study.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 7105 Biostatistics III (3 units)

Advanced methods in applied biostatistics. Sample topics include: likelihood and Bayesian inferential techniques, simulation and numerical methods, techniques for regression modeling, missing data analysis, propensity scores.

Course Component: Lecture

Prerequisites: (EPI 5242 or MAT 5375), (EPI 5344 or EPI 5345 or EPI 5346 or EPI 6276).

EPI 7106 Mixed Research Methods (3 units)

This course introduces students to the major concepts and issues involved in mixed methods approaches to tackle important questions in the field of health research. It is designed for students who have a foundation in either qualitative or quantitative empirical methods. Students will first focus their learning on developing a foundation in the other methodological strand. Subsequently, strategies and decision-making about when and how to use mixed-methods and models to study health research.

Course Component: Lecture

Prerequisites: EPI 5240, (EPI 5102 or EPI 5242 or PBH 5107).

EPI 7108 Epidemiology III (3 units)

Focuses on important study design and methodological considerations in Analytic Epidemiology Topics will include theory and methods in the study of the etiology of health conditions and prognostic factors, current theories of disease causation, application of causal models to epidemiologic questions, implications for study design and analysis, confounding and bias, and methods for longitudinal data

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 7109 Clinical and Applied Epidemiology (3 units)

Issues of current debate in Clinical and Applied Epidemiology and epidemiological methods. Topics will include clinical health interventions related to individual patient care; research related to the design and delivery of broader health systems and services; current analytical methods and population-based studies; decision rules; randomized clinical trials; diagnostic tests; interventions that are relevant to public health practice.

Course Component: Lecture

Prerequisite: EPI 5240.

EPI 7110 Theories, Models, and Frameworks for Implementation Science (3 units)

This course will provide an overview of current theories, models and frameworks relevant to the implementation science discipline. Students will learn about their strengths and limitations, how they can be applied, current research gaps, and how to advance research innovation in these areas.

Course Component: Lecture

Prerequisites: EPI 5240, EPI 6345.

EPI 7113 Special Topics in Health Research (3 units)

Variable topics depending on the interests of students and faculty.

Course Component: Lecture

EPI 7184 Health Policy II (3 units)

Exploration of advanced concepts in the design, analysis, implementation and evaluation of public health and health care policies. Presentations by invited experts, case studies, seminar presentations by students.

Course Component: Lecture

Prerequisite: EPI 5103.

EPI 7189 Advanced Health Economic Evaluation (3 units)

Advanced methods in health economic evaluation. Topics include, handling correlation, analyzing cost data, analyzing survival data, incorporating covariates and the need to calibrate, incorporating time dependent parameters, value of information analysis, deriving individual patient survival data from graphs and methods for individual patient simulation.

Course Component: Lecture

Prerequisite: EPI 5189.

EPI 7302 Observational Designs (1.5 units)

Examination of the case-control method from conceptual, practical and analytical perspectives. Potential biases of different approaches. Role of nested case-control studies. Case-cohort, case-based, case-only and case-crossover designs. Implications of sampling methods for analytical approaches. Analysis of sample data sets, using SAS or STATA. The relationship between quantitative and qualitative research.

Course Component: Lecture

EPI 7501 Épidémiologie génétique (3 crédits)

Étude de l'application de méthodes de la biologie génétique à la recherche épidémiologique. Élaboration d'hypothèses de recherche; déterminants génétiques et interactions entre facteurs génétiques et environnementaux; utilisation de biomarqueurs pour la mesure d'une exposition et de son résultat ainsi que pour l'établissement d'un pronostic. Réalisation d'un projet d'étude d'épidémiologie génétique.

Volet : Cours magistral

Préalable: EPI 5240.

EPI 7505 Biostatistique III (3 crédits)

Méthodes avancées en biostatistique et en modélisation des probabilités. Les exemples de sujets comprennent: estimation bayésienne des paramètres ; construction et utilisation des vraisemblances ; tests d'hypothèses ; comparaison des méthodes d'inférence utilisant les approximations jackknife, bootstrap et norma.

Volet : Cours magistral

Préalables : EPI 5241, ((3 crédits parmi : EPI 6276, MAT 5375) ou (6 crédits parmi : EPI 5344, EPI 5345, EPI 5346)).

EPI 7506 Méthodes mixtes dans la recherche en santé (3 crédits)

Ce cours présente aux étudiants les principaux concepts et problèmes liés aux méthodes mixtes pour aborder des questions importantes dans le domaine de la recherche sur la santé. Il est conçu pour les étudiants qui ont des bases en méthodes empiriques qualitatives ou quantitatives. Les étudiants concentreront d'abord leur apprentissage sur le développement d'une base dans l'autre volet méthodologique. Par la suite, les stratégies et la prise de décision concernant le moment et la manière d'utiliser des méthodes et des modèles mixtes pour étudier la recherche en santé.

Volet : Cours magistral

Préalable: EPI 5240.

EPI 7508 Épidémiologie III (3 crédits)

L'accent est mis sur les considérations méthodologiques et de conception d'étude importantes en épidémiologie analytique. Les sujets abordés incluront la théorie et les méthodes dans l'étude de l'étiologie des conditions de santé et des facteurs pronostiques, les théories actuelles de la causalité des maladies, l'application des modèles de causalité aux questions épidémiologiques, les implications pour la conception et l'analyse de l'étude, la confusion et les biais, et les méthodes pour les données à long terme.

Volet : Cours magistral

Préalable: EPI 5241.

EPI 7509 Épidémiologie clinique et appliquée (3 crédits)

Questions actuellement débattues en épidémiologie clinique et appliquée, ainsi qu'à propos des méthodes de l'épidémiologie. Sujets abordés : interventions cliniques liées aux soins aux patients particuliers; recherche liée à la conception et à la prestation de systèmes et services élargis de soins de santé; méthodes analytiques actuelles et études de population; règles de décision; essais cliniques aléatoires; tests diagnostiques; interventions pertinentes en matière de santé publique.
Volet : Cours magistral
Préalable: EPI 5240.

EPI 7702 Études d'observation (1.5 crédits)

Examen de la méthode des cas témoins sur les plans conceptuel, pratique et analytique. Biais potentiel de différentes approches. Rôle d'études cas témoins imbriquées. Étude cas-cohorte, étude avec l'échantillonnage liée aux cas, protocole limité aux cas et protocole croisé. Conséquences des méthodes d'échantillonnage sur les méthodes d'analyse. Analyse d'échantillons de données à l'aide de SAS ou de STATA. Relations entre recherche qualitative et recherche quantitative.
Volet : Cours magistral
Préalable: EPI 5241.

EPI 7910 Études dirigées en épidémiologie / Directed Studies in Epidemiology (3 crédits / 3 units)

Étude approfondie d'un sujet d'intérêt particulier pour l'étudiant, sous la direction d'un professeur membre du programme. Préalable : EPI 5240 ou l'équivalent et approbation du Comité des études doctorales. / Directed Studies on a topic of individual interest to the student under the direction of a faculty supervisor. Students planning to take this course must have the proposed content, learning activities and evaluation methods approved by the Doctoral Studies Committee. Prerequisite: EPI 5240 or equivalent.
Volet / Course Component: Cours magistral / Lecture
Préalable : EPI 5240 / Prerequisite: EPI 5240.

EPI 7912 Études dirigées en biostatistique / Directed Studies in Biostatistics (3 crédits / 3 units)

Étude approfondie d'un sujet en biostatistique d'intérêt particulier pour l'étudiant, sous la direction d'un professeur membre du programme. / In-depth study on a topic in biostatistics of individual interest to the student under the direction of a faculty member in the program.
Volet / Course Component: Cours magistral / Lecture
Préalable : EPI 5642 ou MAT 5775. / Prerequisite: EPI 5242 or MAT 5375.

EPI 7913 Thèmes spéciaux en épidémiologie / Special Topics in Epidemiology (3 crédits / 3 units)

Sujets variables selon les intérêts des étudiants et du corps professoral. / Variable topics depending on the interests of students and faculty.
Volet / Course Component: Cours magistral / Lecture

EPI 7980 Stage / Internship

Expérience pratique et exécution d'un projet ayant trait à l'évaluation des technologies de la santé dans un organisme de recherche ou une agence d'évaluation des technologies de la santé, sous la supervision d'un membre du corps professoral. Noté S (satisfaisant) ou NS (non satisfaisant) à partir d'un rapport de stage écrit et des résultats du stage. / Practical experience and completion of a project related to HTA in a research organization or an HTA agency, under the supervision of a faculty member. Graded S (Satisfactory) / NS (Not satisfactory) based on a written report on the project, and on performance during the internship.
Volet / Course Component: Cours magistral / Lecture

EPI 7998 Projet de recherche / Research Project (6 crédits / 6 units)

Mémoire préparé sous la direction d'un ou deux membres du corps professoral choisis en accord avec la personne responsable des études supérieures. Le mémoire est évalué par le ou les personnes qui l'ont dirigé et un autre membre du corps professoral. Noté S (satisfaisant) / NS (non satisfaisant). / Research paper prepared under the direction of one or two professors chosen in consultation with the director of graduate studies. The paper is evaluated by the (co-)advisor(s) and another professor. Graded S (Satisfactory) / NS (Not satisfactory).
Volet / Course Component: Recherche / Research

EPI 8166 Ph.D. Seminar (3 units)

Overview of research methods across different areas of Epidemiology and Applied Health Research. Offered over two consecutive sessions. Compulsory for all students enrolled in the doctoral program in Epidemiology and Applied Health Research. Graded S (Satisfactory) / NS (Not satisfactory).
Course Component: Seminar

EPI 8566 Séminaire de doctorat (3 crédits)

Présentation d'un exposé et participation régulière aux séances de séminaire du département. Offert sur deux sessions consécutives. Obligatoire pour tous les étudiants inscrits au programme de doctorat en philosophie biostatistique, épidémiologie, et recherche appliquée en santé. Noté S (satisfaisant) ou NS (non satisfaisant).
Volet : Cours magistral

EPI 9997 Projet de thèse / Thesis Proposal

Volet / Course Component: Recherche / Research

EPI 9998 Examen de synthèse / Comprehensive Examination

Volet / Course Component: Recherche / Research