EPIDEMIOLOGY AND PUBLIC HEALTH (EPI)

The following courses are offered by the Faculty of Medicine.

EPI 1100 Epidemiology in the Field of Rehabilitation (2 units)
Course Component: Lecture

EPI 4142 Biostatistics (3 units)
Course Component: Lecture

EPI 4542 La biostatistique (3 crédits)
Volet : Cours magistral

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 statistical techniques to manipulate, link, and examine datasets; large health surveys; coding systems; data warehouses; data mining; birth and death registries; use of census data; linking postal codes to geographical files; geographical information systems. Extensive use of SAS as the primary application package.
Course Component: Lecture
Prerequisites: EPI 5240, (EPI 5242 or MAT 5375).

EPI 5144 Global Health Epidemiology and Practice (3 units)
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, research methods, systematic reviews, knowledge translation, communication, ethics, collaboration, funding, sustainability, publication, evaluation, and evidence for global health action.
Course Component: Lecture

EPI 5145 Globalization and Health Equity (3 units)
Keys to understanding how globalization processes are affecting health. Policy options for creating a fairer and more health equitable globalization. Review of relevant theories from sociology, political science (international relations) and political economy; and of evidence derived from all three disciplines, as well as from public health and epidemiology. Explanatory models for public health practice on a global scale.
Course Component: Lecture

EPI 5150 International Health and Development (3 units)
Presentations and seminars on philosophy of international development, international health and demographics, determinants of health, international health and human rights and humanitarian emergencies, tropical diseases and emerging pathogens, aboriginal health issues, impact of new health technologies on international health, cross cultural communication, management methods for international health. Seminar presentation required.
Course Component: Lecture

EPI 5180 International Health and Development (3 units)
Prerequisite: EPI 5240, (EPI 5242 or MAT 5375).
This is a copy of the 2023-2024 catalog.
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)
Consideration of the specialized methods used in the investigation and control of communicable disease. Detailed review of the epidemiology of the major communicable diseases. Lectures, presentations by invited experts, and student presentations.
Course Component: Lecture

EPI 5240 Epidemiology I- Introductory Epidemiology (3 units)
An overview of epidemiology - uses, methods, and data sources. Descriptive and analytical epidemiology. Lectures and assignments in which students will work with data and will gain experience in critically reviewing epidemiologic literature.
Course Component: Lecture
Prerequisite or corequisite: EPI 5242 or PBH 5107.

EPI 5241 Epidemiology II: Advanced Epidemiology (3 units)
This second level epidemiology course covers major principles of design, analysis, and interpretation of epidemiologic research. Material presented in a quantitative manner.
Course Component: Lecture
Prerequisites: EPI 5240, EPI 6276.

EPI 5242 Biostatistics I (3 units)
Building on the students' prior background in statistics, this course explores the use of mathematical models in statistical data analysis. Topics include analysis of categorical data, choice of linear vs non-linear models, estimation of parameters, testing of hypotheses by parametric and non-parametric methods, analysis of variance, linear and logistic regression models, introduction to survival analysis.
Course Component: Discussion Group, Lecture
Permission of the Department is required.

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

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 5340 Epidemiological Methods (1.5 unit)
Major principles of study design and analysis; validity in epidemiologic studies; precision and statistics in epidemiology studies; confounding; additive and multiplicative interaction; stratified analysis; regression models; regression modeling; bias analysis; analytical strategy.
Course Component: Lecture
Corequisites: EPI 5240, (EPI 5242 or MAT 5375).

EPI 5341 Epidemiological Applications (1.5 unit)
Interpretation of epidemiologic research and some specific topics: complex survey data analysis; attributable risk, odds ratio and relative risk estimation in multivariate analysis; combined effect of multiple exposures and interaction measures; chronic disease screening and surveillance; environmental epidemiology.
Course Component: Lecture
Prerequisite: EPI 5340

EPI 5342 Genetic Epidemiology (1.5 unit)
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
EPI 5342 is a corequisite to EPI 5340.

EPI 5343 Outcome Measures in Health Research (1.5 unit)
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
EPI 5343 is a corequisite to EPI 5340.

EPI 5344 Survival Analysis in the Health Sciences (1.5 unit)
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
EPI 5344 is a corequisite to EPI 5340.
EPI 5345 Applied Logistic Regression (1.5 unit)
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
EPI 5345 is a corequisite to EPI 5340.

EPI 5346 Applied Longitudinal and Clustered Data Analysis (1.5 unit)
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
EPI 5346 is a corequisite to EPI 5340.

EPI 5347 STATA FOR EPIDEMIOLOGICAL ANALYSIS (1.5 unit)
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 5346 MSc Seminar
Seminars on topics in Epidemiology 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 5545 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 Mondialisation et équité en santé (3 crédits)
Pistes pour la compréhension de la manière dont la mondialisation touche à la santé et aux politiques mondiales d'équité en santé. L'examen de théories pertinentes puisées dans la sociologie, la science politique (relations internationales) et l'économie politique, et des données probantes issues de ces trois disciplines, ainsi que de l'épidémiologie et de la santé publique. Modèles explicatifs pour la santé publique à l'échelle mondiale.

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 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 Intervention Studies in Health Research (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 meta-analysis on a topic of their own interest.

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

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 Quantitative Methods in Epidemiology (3 units)
Application of advanced topics in statistical methods for epidemiologic data analysis: logistic regression and discriminant analysis, Poisson regression, contingency table analysis (including log-linear modelling), time series, survival analysis, Cox regression with and without time-dependent covariates, principle components and factor analysis.
Course Component: Lecture
Prerequisites: EPI 5240 (may be done concurrently), (EPI 5242 or MAT 5375).

EPI 6278 Advanced Clinical Trials (3 units)
Lectures and laboratories on the detailed principles, design, methodology and statistical techniques associated with clinical trials. Emphasis on emerging topics and procedures.
Course Component: Lecture
Prerequisites: EPI 6178, (EPI 5242 or MAT 5375).

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 Epidemiology (1.5 unit)
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 Knowledge Translation in Health Research (3 units)
Identification of a practice/policy issue or concern in epidemiology, public health and other health disciplines. Critical appraisal of relevant research and contextualization of knowledge to be mobilized. Assessment and analysis of the knowledge: healthcare practice/policy gap, barriers and supports. Design of pragmatic knowledge to action strategy based on planned action models.
Course Component: Lecture
Prerequisites: EPI 5240, (EPI 5242 or MAT 5375).

EPI 6581 Introduction à l’épidémiologie sociale (3 crédits)
Analyse de l’influence des forces sociales et du comportement humain sur le développement de la maladie. L’interaction entre le comportement et les systèmes physiologique et endocrinien, y compris le processus psychosomatique. Les indications pour l’intervention préventive par la modification du mode de vie.
Volet : Cours magistral
Préalable: Permission du responsable du programme.
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 7113 Special Topics in Epidemiology (3 units)
Variable topics depending on the interests of students and faculty.
Course Component: Lecture

EPI 7184 Health Policy (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 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 unit)
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
Prerequisite: EPI 5189.

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 Méthodes avancées de biostatistique : Inférence statistique (3 crédits)
Méthodes avancées de biostatistique et de modélisation probabiliste. Exemples de sujets abordés : estimation bayésienne de paramètres; construction et utilisation de vraisemblances; tests d'hypothèses; comparaison de méthodes d'inférence à l'aide de la technique du ré-échantillonnage jackknife, d'une amorce et d'approximations normales.
Volet : Cours magistral
Préalables : (EPI 5642 ou MAT5775), (EPI 5344 ou EPI 5345 ou EPI 5346).

EPI 7506 Méthodes de recherche qualitative en épidémiologie (3 crédits)
Cadres théoriques et méthodes correspondantes de recherche qualitative appliquées à la recherche en épidémiologie. Sujets abordés : paradigmes théoriques de la recherche qualitative; recherche qualitative adaptée à divers types de questions; objectifs et procédés d'échantillonnage; méthodes de collecte, d'analyse et d'interprétation de données; critères de qualité pour l'évaluation d'une recherche qualitative; questions d'éthique et responsabilités des chercheurs en matière de recherche qualitative. Relations entre recherche qualitative et recherche quantitative.
Volet : Cours magistral
Préalable: EPI 5240.

EPI 7508 Épidémiologie analytique (3 crédits)
Questions actuellement débattues en épidémiologie analytique et à propos des méthodes de l'épidémiologie. Sujets abordés : théorie et méthodes de l'étude de l'étiologie des affections et de leurs facteurs de pronostic; théories actuelles sur les causes des maladies; application de modèles de causalité à des questions d'épidémiologie; conséquences sur la conception de protocoles, l'analyse de données et les erreurs de mesure.
Volet : Cours magistral
Préalable: EPI 5240.

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 crédit)
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 lié 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 5642.

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 Mémoire / Research Paper (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)
Presentation of one seminar as well as regular attendance at the
departmental seminar series. Offered over two consecutive sessions.
Compulsory for all students enrolled in the doctoral program in
Epidemiology. 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
épidémiologie. 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