

Department/Academic Unit: **Public Health Sciences**

Degree Program: **Master of Sciences Epidemiology**

Degree Level Expectations, Learning Outcomes, Indicators of Achievement and the Program Requirements that Support the Learning Outcomes

DLE – Master of Sciences Epidemiology	Learning Outcomes (program specific) This degree is awarded to students who demonstrate:	Relevant Courses, Academic Requirement (requirements that contribute to the achievement of learning outcomes and degree expectations	Indicators of Achievement As evidenced by:
<i>Depth and breadth of knowledge</i>	<p>1 Understanding of basic and intermediate biostatistics methods</p> <p>Descriptive statistics, confidence intervals, significance tests, and power and sample size determination, ANOVA and regression models for difference types of outcome data (multiple logistic, Poisson).</p> <p>2. Understanding of the basic methods of descriptive and analytical epidemiology</p> <p>Appropriate study designs to describe health problems; to investigate causal factors (personal or environmental) and to evaluate the interventions and</p>	<p>EPID 801 Introduction to Epidemiology</p> <p>EPID 804 Advanced Epidemiology</p> <p>EPID 822 Intermediate Biostatistics, plus three other courses offered by the Department, other departments at Queen’s or at approved institutions</p> <p>EPID 899 Thesis (outline, proposal, write-up, defence</p>	<p>Successful completion of assignments, quizzes, mid-term and final examinations in EPID 821, EPID 822</p> <p>Demonstration of mastery of intermediate biostatistical concepts and models required in course protocols, thesis outline, protocol, write-up and defence</p> <p>Successful completion of mid-term and final examinations (as appropriate) in EPID 801, EPID</p> <p>Demonstration of mastery of core epidemiological concepts in course protocols, thesis outline protocol, write-up and defence</p>

	<p>outcomes of treatment/ interventions</p> <p>3. Understanding of epidemiological concepts</p> <p>Three major types of study bias (selection, information and confounding), statistical significance vs public health/clinical significance, effect modification vs confounding, models of causation underpinning the analysis of communicable and non-communicable disease patterning</p> <p>4. Detailed and comprehensive knowledge of content as well as the specialized methods used within the thesis speciality area</p>		<p>Successful completion of assignments, mid-term and final examinations (as appropriate) in EPID 801, EPID 804 and selective electives (eg. EPID 828)</p> <p>Demonstration of mastery of core epidemiological concepts in course protocols, thesis outline, protocol write-up and defence</p> <p>Critical review of literature and interpretation of thesis results (write-up and defence).</p>
<p><i>Research and Scholarship</i></p>	<p>1 Ability to critically read and appraise the research literature</p> <p>2 Capability to define and refine research questions</p> <p>3. Use of appropriate techniques in data collection and/or management and analysis</p>	<p>EPID 801 Introductory Epidemiology EPID 804 Advanced Epidemiologic Methods EPID 821 Introductory Biostatistics EPID 822 Intermediate Biostatistics, plus 3 other courses offered by the Department (Eg. EPID 810 Controlled Clinical Trials), other departments at Queen's or approved institutions</p>	<p>EPID 804 assignments aimed at critical appraisal, internal validity, external validity</p> <p>EPID 821 and EPID 822 assignments aimed at defining proper questions and hypotheses. Thesis outline submitted by May 31 each year</p> <p>EPID 804 study protocol assignments (design workshop,</p>

	<p>4. Competency in proposal writing (including meeting requirements for ethical approval)</p> <p>5. Competency in design and conduct of a research project using epidemiologic methods</p>	<p>EPID 899 Thesis</p>	<p>final protocol)</p> <p>Successful defence of proposal and thesis</p> <p>EPID 804 study protocol assignments</p> <p>Thesis proposal submitted by Aug 31 of first year</p> <p>Thesis defended by August 31 of second year</p>
<p><i>Application of Knowledge</i></p>	<p>1. The ability to apply basic and intermediate biostatistical methods</p> <p>Describing categorical and continuous data</p> <p>Compare two or more groups (independent or matched) where the measurements are categorical, ordinal, continuous or censored survival data</p> <p>Examine the effects of one or more explanatory variables on a categorical , discrete, continuous, or censored dependent variable</p> <p>Examine the appropriateness of underlying assumptions taking corrective actions where indicated and interpreting the fitted model in relation to the</p>	<p>EPID 801 Introductory Epidemiology</p> <p>EPID 804 Advanced Epidemiologic Methods</p> <p>EPID 821 Introductory Biostatistics</p> <p>EPID 822 Intermediate Biostatistics</p> <p>Plus three by choice from other courses offered by the Department, other Departments at Queen's or at approved institutions.</p> <p>EPID 899 thesis</p>	<p>EPID 821 assignments, midterm and exam</p> <p>EPID 822 assignments, midterm and exam</p> <p>Successful completion of select elective assignments, midterms and exams (eg. EPID 828 Infectious Diseases)</p> <p>EPID 822 SAS lab practices and quizzes</p> <p>Successful defence of proposal and thesis</p>

	<p>objectives of the analysis</p> <p>Calculate the sample size or power for a given study design involving one or two groups</p> <p>Intermediate skills using SAS including importing/exporting data, selecting appropriate forms of analysis, performing analyses and interpreting the output in order to demonstrate the other learning outcomes</p> <p>2. The ability to calculate epidemiologic measures</p> <p>Measures of disease occurrence (eg. Incidence) and other population health indicators (infant versus perinatal mortality rate, life expectancy), measures of association between exposures and disease (eg. Relative risk) and measure of public health impact (eg. Population attributable risk)</p> <p>Age-adjusted mortality and morbidity rates using the direct and indirect methods.</p> <p>Validity of a screening and/or diagnostic test (sensitivity, specificity, positive predictive value, likelihood ratio etc)</p>		<p>EPID 801 midterm and exam</p> <p>EPID 804 midterm and exam</p> <p>Successful completion of select elective midterms (eg. EPID 828)</p> <p>Thesis successfully defended by August 31 of 2nd year</p>
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	3. The ability to apply appropriate study designs for descriptive and analytical epidemiology		
<i>Professional capacity/autonomy</i>	<p>1. Teaching skills through seminar and class presentations.</p> <p>2. Mentoring skills collaboration with other students and research project personnel</p> <p>3. Awareness of ethics in research.</p> <p>4. Ability to disseminate research findings through publications in credible scholarly journals (1 manuscript as first author, can be included in final thesis).</p> <p>5. Ability to facilitate group/team work and operate effectively as a member of a group or team.</p> <p>Elicit problems and issues, frame problems in scientific terms, advise on appropriate research methods, advise on methods of data collection and analysis (including statistical analyses), interpret findings</p> <p>6. Decision-making skills (through using analytical, critical thinking and problem-solving)</p>	<p>EPID 801 Introductory Epidemiology</p> <p>EPID 804 Advanced Epidemiologic Methods</p> <p>EPID 821 Introductory Biostatistics</p> <p>EPID 822 Intermediate Biostatistics, plus 3 by choice from other courses offered by the Department, other Departments at Queen's</p> <p>EPID 899 Thesis Progress Report</p>	<p>Elective course requirement for class presentations (eg. EPID 828)</p> <p>TA evaluation reports</p> <p>Evaluation from thesis supervisor</p> <p>Research group peer feedback (where applicable)</p> <p>Obtained ethics approval for thesis</p> <p>One manuscript in thesis OR as part of course requirement</p> <p>Successful completion of select elective course requirement for group work (eg. EPID 828)</p> <p>Evaluation from thesis supervisor</p> <p>Research group peer feedback (where applicable)</p> <p>Evaluation from thesis supervisor</p> <p>Research group peer feedback (where applicable)</p>

<p><i>Communication Skills</i></p>	<p>1 The ability to describe theories and methods of knowledge transfer and dissemination</p> <p>2. Effective written and oral communication in a range of contexts</p> <p>3. The ability to appropriately present an oral and written report to summarize information relevant to a study question.</p> <p>4. Information literacy (collecting and interpreting information from a variety of traditional and new technology and sources)</p> <p>5. The ability to effectively use information technology to communicate, locate information and analyze data</p>	<p>EPID 801 Introductory Epidemiology</p> <p>EPID 804 Advanced Epidemiologic Methods</p> <p>EPID 821 Introductory Biostatistics</p> <p>EPID 822 Intermediate Biostatistics, plus 3 by choice from other courses offered by the Department, other departments at Queen's or at approved institutions.</p> <p>EPID 899 thesis</p> <p>Progress report</p>	<p>Thesis proposal. Manuscripts prepared as part of thesis.</p> <p>Successful debate presented (EPID 801)</p> <p>Successful completion of elective course assignments such as EPID 828</p> <p>Successful thesis defence</p> <p>Successfully defend proposal and thesis</p> <p>Successful completion of elective course assignments such as EPID 828</p> <p>Evaluation from academic advisor or thesis supervisor at end of each term.</p>
<p><i>Awareness of limits of knowledge</i></p>	<p>1 Cognizance of the complexity of knowledge and of the potential contributions of other interpretations, methods and disciplines.</p> <p>Identification of strengths and limitations as well as need for further research</p>	<p>EPID 801 Introductory Epidemiology</p> <p>EPID 804 Advanced Epidemiologic Methods</p> <p>EPID 821 Introductory Biostatistics</p> <p>EPID 822 Intermediate Biostatistics,</p>	<p>Understand the assumptions and restrictions of the basic statistical models and methods, and the consequences of using the models when the assumptions and restrictions are not satisfied.</p> <p>Identification of strengths and limitations in thesis outline, proposal, final document and defence.</p>

		<p>plus 3 by choice from other courses offered by the Department, other departments at Queen's or at approved institutions.</p> <p>EPID 899 thesis Progress report</p>	<p>Evaluation from academic advisor of thesis supervisor at end of each term.</p>
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