

COMPETENCIES AND LEARNING OUTCOMES

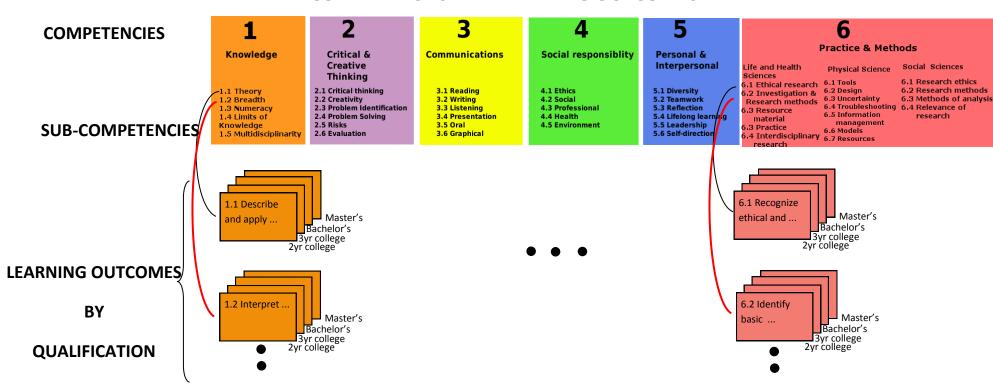


Figure 1: Characteristics of qualification levels and sector-wide learning outcomes

Table 1: Characteristics of Qualification Levels

The following describe characteristics of the activities expected of students at each of the qualification levels

Characteristics	Two-year Diploma Activities	Three-year Diploma Activities	Bachelor's Degree Activities	Master's Degree Activities
	are well-defined and	are broadly-defined	are complex and	are exploratory
Processes and Scope	have clear constraints and processes, limited scope and involve unambiguous information	involve adaptation/extension of standard processes; may have loose constraints and/or involve conflicting information	require abstract thinking where processes are not immediately apparent; have a wide scope; often involve ambiguous or uncertain information	require abstract thinking where processes are not immediately apparent; have an open scope; often involve unknown information and constraints
Required Knowledge Base	involve using limited theoretical knowledge but extensive practical knowledge	involve extensive practical knowledge as it relates to fundamental theoretical knowledge	involve a focus on theoretical knowledge as it relates to practical knowledge	involve extensive and current theoretical knowledge related to the research area
Interdependence	involve discrete and self-contained problems	involve elements of extensive problems	involve multiple elements or sub-problems which are interconnected	involve the extension of interconnected ideas and concepts
Innovation	involve the use of existing concepts or processes in modified ways	involve the use of concepts or processes in non-standard ways	involve the creative use of principles and research-based knowledge in novel ways	involve the creation of new knowledge or novel application of existing knowledge to new areas
Autonomy	have prescribed goals and methods; activities supervised	have goals and method loosely prescribed and activities supervised	require independent determination of processes and methods with periodic supervision	involve conducting independent research with limited supervision

Competencies and learning outcomes





1 Knowledge

		Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
1.	. 1	Theory and Concepts	Describe and apply the key concepts, theories and practices in the discipline	Describe and apply major theories, principles and practices in the discipline	Drawing on fundamental principles, describe, apply and integrate major theories and practices in the discipline	Drawing on fundamental principles, describe, apply and integrate the major theories, research methods and approaches to inquiry and/or schools of practice in the field of study
1.	.2	Numeracy	Interpret quantitative information, apply quantitative reasoning and perform appropriate calculations to draw conclusions	Interpret quantitative information, apply quantitative reasoning and perform appropriate calculations to draw conclusions	Interpret quantitative information, apply quantitative reasoning and perform appropriate calculations to draw conclusions	Interpret quantitative information, apply quantitative reasoning and perform appropriate calculations to draw conclusions
1.	.3	Limits of Knowledge & Qualification	Describe limitations of personal knowledge and tasks for which they are qualified	Describe limitations of personal knowledge and tasks for which they are qualified	Describe the limits to their own knowledge and how uncertainty influences their analyses and interpretations.	Delineate the current limits of theory, knowledge and/or practice in the field and how uncertainty influences analyses and interpretations.
1.	.4	Multidisciplinary	Apply prescribed principles from related disciplines	Identify and apply principles from related disciplines	Identify and integrate principles from related disciplines	Identify and integrate principles of other fields of study in independent research
1.	5	Breadth of Knowledge	Describe and apply basic concepts theories and practices from across the sectors	Describe and apply basic concepts theories and practices from across the sectors	Describe and apply basic concepts theories and practices from across the sectors	Describe and apply basic concepts theories and practices from across the sectors



Critical and Creative Thinking

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
2.1	2.1 Critical Thinking	Identify and compare assumptions and arguments	Critically evaluate assumptions and arguments and defend a standpoint/ solution	Critically evaluate underlying assumptions and arguments, develop and support a standpoint/solution and address solution's applicability	Critically evaluate underlying assumptions and arguments, including those in own work, develop and support a standpoint/solution and address solution's applicability
2.2	Creativity	Adapt existing ideas or techniques to respond to a specific issue	Adapt existing ideas or techniques to respond to a specific issue	Devise innovative approaches which may build on existing ideas or techniques	Devise innovative approaches which may build on existing ideas or techniques and discusses the implications for the field
2.3	Problem Identification	Identify and define a problem	Identify and define a problem	Identify and define a problem and the associated constraints and objectives	Identify and define a complex problem and the associated constraints and objectives
2.4	Problem Solving	Compare a prescribed set of solutions to a problem; choose and implement the most suitable approach	Evaluate possible solutions to a problem; adapt and implement the most suitable approach	Independently evaluate possible solutions to a problem; develop and implement a suitable approach	Independently evaluate a comprehensive range of possible solutions to a complex problem; develop and implement a suitable approach



2 Critical and Creative Thinking (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
2.5	Compares and Contrasts Risks and Benefits	Mitigate possible risks associated with solving a problem using prescribed methods	Anticipate and mitigate potential risks associated with a problem using prescribed methods	Compare and contrast the risks and benefits of different strategies for responding to various problems	Evaluate risks and benefits of different strategies, including broader implications of available options
2.6	Evaluation	Assess the quality of results and draws conclusions	Assess the relevance and reasonableness of assumptions and quality of results, draw conclusions and recommend directions for future work	Assess the relevance, reasonableness and effectiveness of assumptions, methods and quality of results, draw conclusions and recommend directions for future work	Assess the relevance, reasonableness and effectiveness of assumptions, methods and quality of results, draw conclusions and recommend directions for future work



3 Communications

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
3.1	Reading Comprehension	Demonstrate comprehension of written material	Demonstrate comprehension of written material	Demonstrate comprehension and critically evaluate written material, including scholarly sources	Integrate and analyze ideas from multiple written materials, including primary sources, and synthesize diverse perspectives
3.2	Effective Writing	Write coherent and grammatically correct materials that meet specific objectives and audience needs	Write concise, coherent and grammatically correct materials that meet specific objectives and audience needs	Write concise, coherent and grammatically correct materials that reflect critical analysis and synthesis, appropriate to audience needs	Write concise, coherent and grammatically correct materials of publishable quality that reflect critical analysis and synthesis, appropriate to audience needs
3.3	Listening Comprehension	Demonstrate comprehension of information communicated orally	Demonstrate comprehension of information communicated orally	Demonstrate comprehension and critically evaluate information communicated orally, including scholarly ideas	Integrate and analyse information presented orally, including scholarly ideas, and synthesize diverse perspectives



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3 Communications (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
3.4	Presentation Skills	Present material, alone or as part of a team, in a coherent and organized form, using tools as appropriate	Confidently present material, alone or as part of a team, in a coherent and organized form, using tools as appropriate	Effectively present material in a coherent and organized form, using tools as appropriate	Effectively and confidently present material; articulate and defend a position
3.5	Effective Oral Communication Skills	Effectively exchange information and ideas orally	Speak in a confident manner to advance personal or group goals in a variety of settings	Effectively discuss and debate complex ideas orally in a variety of settings	Effectively discuss and debate complex ideas orally and defend a position clearly
3.6	Graphical Communications	Interpret and clearly and creatively represent information in charts, diagrams and other visual forms	Interpret and clearly and creatively represents information in charts, diagrams and other visual forms	Interpret and clearly represent information in charts, diagrams and other visual forms; make perceptive and creative choices to convey information	Interpret and clearly represent information in charts, diagrams and other visual forms; make perceptive and creative choices to convey information



4 Social Responsibility

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's	Master's
4.1	Ethical Principles and Guidelines	Recognize ethical issues and apply ethical principles to a variety of situations	Recognize ethical issues and apply ethical principles to a variety of situations	Recognize ethical issues, critically analyze various perspectives and apply ethical principles to complex situations	Integrate ethical doctrine, guidelines and procedures relevant for the responsible conduct of research or practice
4.2	Social Awareness / Impact	Describe the impact of decisions and actions on society	Describe and evaluate the impact of decisions and actions on society	Describe and evaluate the impact of decisions and actions on society	Describe and evaluate the impact of their scholarship on society
4.3	Professional and Legal Responsibilities	Describe and demonstrate compliance with relevant laws, legislation and professional codes of practice and ethics	Describe and demonstrate compliance with relevant laws, legislation and professional codes of practice and ethics	Interpret and apply relevant laws, legislation and professional codes of practice and ethics	Interpret and apply relevant laws, legislation and professional codes of practice and ethics
4.4	Health and Safety	Adhere to applicable health and safety codes and best practices	Adhere to applicable health and safety codes and best practices, and identify underlying risk/liability issues	Interpret and apply safety codes, best practices and risk management principles	Interpret and apply safety codes, best practices and risk management principles



4 Social Responsibility (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's	Master's
4.	Environment and Sustainability	Describe environmental issues and the environmental impact of decisions and actions, and incorporate sustainability into decision making	Describe environmental issues and the environmental impact of decisions and actions, and incorporate sustainability into decision making	Describe environmental issues and the environmental impact of decisions and actions, and incorporate sustainability into decision making	Describe environmental issues and the environmental impact of decisions and actions, and incorporate sustainability into decision making



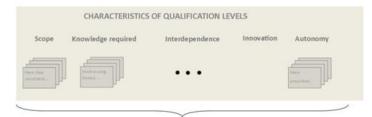
5 Personal and Interpersonal

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's	Master's
5.1	Diversity and Respect	Demonstrate an appreciation and respect for diversity in individuals, cultures, perspectives, values, belief systems and roles, including the limitations of one's personal perspective	Demonstrate an appreciation and respect for diversity in individuals, cultures, perspectives, values, belief systems and roles, including the limitations of one's personal perspective	Demonstrate an appreciation and respect for diversity in individuals, cultures, perspectives, values, belief systems and roles, including the limitations of one's personal perspective	Demonstrate an appreciation and respect for diversity in individuals, cultures, perspectives, values, belief systems and roles, including the limitations of one's personal perspective
5.2	Teamwork	Work in a team to achieve group goals and contribute to effective working relationships; work to resolve conflicts or seek assistance as needed	Work in a team to achieve group goals and contribute to effective working relationships; work to resolve conflicts or seek assistance as needed	Work in a team to achieve group goals and contribute to effective working relationships; develop strategies to address conflict as required	Work effectively within a team, manage team dynamics and take on a leadership role as required
5.3	Personal Reflection	Review, reflect on and make improvements to individual performance, and provide and respond to feedback	Review, reflect on and make improvements to individual performance, and provide and respond to feedback	Review, reflect on and make improvements to individual performance, and provide and respond to feedback	Review, reflect on and make improvements to individual performance, and provide and respond to feedback



5 Personal and Interpersonal (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's	Master's
5.4	Self-direction and Independent Work	Demonstrate initiative in setting goals and completing tasks	Demonstrate initiative in setting goals and completing tasks	Demonstrate initiative in setting goals and completing tasks	Demonstrate initiative in setting goals and completing tasks necessary to conduct independent research
5.5	Lifelong Learning	Develop own goals and create a long-term plan for learning and professional growth	Develop own goals and create a long-term plan for learning and professional growth	Develop own goals and create a long-term plan for learning and professional growth	Develop own learning goals and long-term strategies for personal and professional growth



Life and Health Science Sector Specific Outcomes

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6 Practice and Methods

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
6.1	Investigation / Research Methods	Identify basic scientific methods to approach given problems	Apply basic scientific methods to research questions	Utilize a variety of methodologies to conduct or contribute to research	Apply existing and developing concepts, designs, techniques and current research from one or more areas of study in research application
6.2	Resource Material	Use provided criteria; evaluate and select specific information to meet a need from prescribed sources	Evaluate and select reliable information from self-selected sources	Use self-determined criteria; identify, critically evaluate and access a range of reliable information, including scholarly sources	Use self-determined criteria; identify, critically evaluate and access a comprehensive range of reliable information, including scholarly sources
6.3	Formatting / Referencing	Reference source material accurately and in prescribed format	Reference source material accurately and in prescribed format	Reference source material accurately and in prescribed format	Reference source material accurately and in prescribed format
6.4	Practice	Apply knowledge, skills and behaviours acquired in an academic setting to a variety of practice settings	Apply knowledge, skills and behaviours acquired in an academic setting to a variety of practice settings	Apply knowledge, skills and behaviours acquired in an academic setting to a variety of practice settings	Apply knowledge, skills and behaviours acquired in an academic setting to a variety of practice settings
6.5	Ethical Research	Recognize ethical and unethical practices in research	Comply with applicable ethical research practices and protocols (i.e., Tri-Council)	Comply with applicable ethical research practices and protocols (i.e., Tri-Council)	Design and carry out research in an ethical manner



6 Life and Health Science Sector Practice and Methods (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
6.6	Interdisciplinary Practice	Work collaboratively within a multidisciplinary team	Work collaboratively within a multidisciplinary team	Work collaboratively within a multidisciplinary team	Work collaboratively within a multidisciplinary team
6.7	Resource Management	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks



Physical Science Sector Specific Outcomes

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6 Practice and Methods

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree	
6.1	Tools, Instruments, and Equipment (Hardware and Software)	Conduct practical building, experimentation, testing and measurement using specialized and standard tools, instruments and equipment	Conduct practical building, experimentation, testing and measurement using and adapting specialized and standard tools, instruments and equipment	Apply and adapt standard tools, instruments and equipment	Independently apply and adapt tools, instruments and equipment	
6.2	Design	Design and conduct a simple experiment or build a simple product to solve a well-defined problem	Design and conduct an experiment or build a product to solve a specific problem	Design and conduct/implement an experiment, product, process or system to answer a question or solve a problem	Independently define, design and conduct/implement an experiment, product, process or system to answer a question or solve a problem	
6.3	Uncertainty	Recognize and list uncertainties in analysis, interpretation and measurement	Describe the nature and possible causes of uncertainties in analysis, interpretation and measurement	Describe the nature and possible causes of uncertainty in analysis, interpretation and measurement, and evaluate uncertainty in conclusions	Describe the nature and possible causes of uncertainty in analysis, interpretation and measurement, and evaluate uncertainty in conclusions	
6.4	Troubleshooting	Apply prescribed troubleshooting processes to resolve issues	Apply and adapt troubleshooting processes to resolve issues	Apply problem solving approaches to troubleshoot issues	Apply problem solving approaches to troubleshoot issues	



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6 Physical Science Sector Practice and Methods (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
6.5	Information Management	Locate, organize and integrate information using appropriate information systems	Locate, organize and evaluate information using appropriate information systems	Locate, organize and critically evaluate a range of information, including scholarly sources and databases, using appropriate information systems	Locate, organize and critically evaluate a range of information, including a comprehensive range of scholarly sources and databases, using appropriate information systems
6.6	Models	Recognize and apply models (mathematical representations, flowchart, block diagrams) of systems in appropriate contexts	and select and adapt assumptions and models to suit the nature of the problem and needs of the solution	Create and apply a model of a system to resolve a problem	Create and apply a model of a system to resolve a problem
6.7	Resource Management	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks	Select and manage resources effectively to complete projects/tasks



Social Science Sector Specific Outcomes

6 Practice and Methods

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	Subcompetend	y Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree		
6	Information .1 Management and Assessmen	Locate, organize and integrate information using reliable information sources	Locate, organize and evaluate information using reliable information sources	Locate, organize and evaluate information, with emphasis on primary sources	Locate, organize synthesize and critically evaluate information, with emphasis on primary sources, and with the goal of identifying opportunities for further contributions to the field of study or practice		
6	.2 Ethics of Research	Recognize ethical and unethical practices in research (e.g., Tri-Council ethics protocols)	Recognize ethical and unethical practices in research (e.g., Tri-Council ethics protocols)	Recognize ethical and unethical practices in research and comply with applicable ethics protocols (e.g., Tri-Council)	Recognize ethical and unethical practices in research and implement applicable ethics protocols (e.g., Tri-Council)		
6	.3 Research Methods	Identify the basic social scientific method(s) appropriate for a given problem	Apply the basic social scientific method(s) appropriate for a given problem	Select and apply the appropriate social scientific method(s) to investigate a given problem	Design social scientific research that provides empirical testing of a variety of theoretical perspectives		



6 Social Science Sector Practice and Methods (cont'd)

	Subcompetency	Two-year Diploma	Three-year Diploma	Bachelor's Degree	Master's Degree
6.4	Methods of Analysis	Calculate and comprehend descriptive statistics, and critically evaluate claims that are based on these statistics	Calculate and comprehend descriptive statistics, and critically evaluate claims that are based on these statistics	Evaluate or apply the appropriate analytical techniques to address theoretical hypotheses across various research designs, identifying possible causes of uncertainties in the analysis, interpretation, measurement and conclusions	Select and apply complex area- specific analytical techniques to address theoretical hypotheses with respect to a specific problem, identifying uncertainties in conclusions, the causes of those uncertainties and potential ways of resolving them
6.5	Relevance of Research	Apply research knowledge in a practical setting	Apply research knowledge in a practical setting	Evaluate the implications of research for theoretical arguments and evidence-based resolution for the problem under investigation	Critically assess the broader implications of practice and research for theories, methods and future investigations

Appendix A Glossary

Abstract thinking—Thinking characterized by the ability to use concepts and to make and understand generalizations, such as of the properties or pattern shared by a variety of items or events.

Advocacy – The act or process of supporting a cause, idea, policy or proposal, including arguing in favour of something or the use of forceful persuasion.

Allied health professions— Those health professions that are distinct from medicine, dentistry, pharmacy and nursing.

Applied learning – Hands-on, practical learning experience where students apply what they know.

Assessment – The process of gathering information that accurately reflects how well a student is achieving the curriculum expectations in a course or program. Typical methods used to either evaluate the learner's achievement in a course unit or module (i.e., summative assessment) or to inform further learning (i.e., formative assessment) include written assessments, oral assessments, laboratory, practical tests/examinations, projects, performances and portfolios.

Formative assessment is ongoing assessment to inform learning. It is intended to improve an individual student's performance, to pursue student learning outcomes at the course or program level, or to improve overall institutional effectiveness. Thus the focus of the assessment is on finding ways to improve rather than on quantifying current levels of competency.

Summative assessment is assessment intended to determine whether or not overall goals have been achieved and to provide either information on performance for an individual student or statistics about a course or program for internal or external accountability purposes. Grades are the most common form of summative assessment.

Best practice –A best practice is a method or technique that has consistently shown results superior to those achieved by other means, and that is used as a benchmark. In addition, a "best" practice can evolve to become better as improvements are discovered.

Competencies – Competencies are broad categories of integrated skills, knowledge and abilities.

Degree and diploma – An academic credential awarded upon successful completion of a prescribed set and sequence of requirements at a specified standard of performance at a recognized institution.

Discipline—An area of study in higher education; a branch of knowledge, research or teaching (e.g. English, mathematics, engineering, psychology).

Ethics – Ethics refers to well-founded standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues. In the academic context, appropriate ethical behaviours are sometimes referred to as "codes of academic conduct." Some educational contexts teach formalized ethical codes related to the discipline or techniques of inquiry or practice (e.g., the Tri-Council code of ethics dictating the rules of human and animal research, legal ethics, professional ethics, medical ethics, etc.)

Exemplar—A high-quality or typical specific example of some more general concept.

Field – An area of specialization or concentration within a discipline (e.g., chemical engineering or cognitive psychology) or, in a multi/interdisciplinary program, a clustered area of specialization.

Graduate Degree Level Expectations (GDLE's)— Guidelines for Graduate Degree Level Expectations developed by the Ontario Council of Academic Vice-Presidents.

Learning outcomes – Clearly defined and measurable statements of learning that reflect the scope and depth of performance; what a learner is expected to know, understand and be able to demonstrate after completion of a process of learning.

Model – A simplified representation of a system or process designed to assist understanding, calculation and prediction, or to test hypotheses.

Practice setting— The place where the student applies the knowledge and skills developed in the academic setting.

Qualitative research—Relating to, measuring, or measured by the quality of something rather than by its quantity.

Quantitative reasoning – Involves the application of mathematical concepts and statistical analysis to formulate arguments and solve problems.

Scholarly information –Information derived from original research and experimentation; criticism and reviews written by experts or scholars, usually published in peer-reviewed journals or books produced by academic presses or presented at professional conferences.

Sectors - A grouping of academic discipline clusters. For example, psychology is in the social sciences, and physics in the Physical Sciences. The groupings of disciplines are largely determined by the Ontario Government Classification system.

Subcompetencies – A cluster of related learning outcomes embedded within the broader competency (e.g., Competency is knowledge, where the subcompetency is numeracy).

Tri Council – The organisations of Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada

Undergraduate Degree Level Expectations (UDLEs) –Guidelines for University Undergraduate Degree Level Expectations developed by the Ontario Council of Academic Vice-Presidents.

