

M.A. Graduate degree level expectations and learning outcomes Mathematics and Statistics

Dimensions of Expectations	Degree level expectations of M.A. in Mathematics and Statistics	Program learning outcomes
Depth and breadth of knowledge	<p>(i) Knowledge and critical understanding of the central concepts, theories and methods of mathematics or statistics disciplines</p> <hr/> <p>(ii) Awareness of how your discipline fits into the broader mathematical and statistical field</p>	<p>(i) Explain and justify the process of proof and/or methodological development in mathematics and statistics (stream dependent)</p> <p>(ii) Identify, describe, and differentiate key theoretical and methodological tools in at least one area in mathematics and statistics (stream dependent)</p> <hr/> <p>(iii) Describe and analyse the current range of methodologies in the field</p>
Research and scholarship	<p>(i) Ability to select and justify appropriate methodologies for given research problems</p> <hr/> <p>(ii) Understanding of mathematical and/or statistical research literature</p> <hr/> <p>(iii) show ability of developing a mathematical or statistical argument in written form</p>	<p>(i) Assess, differentiate and recommend mathematical and statistical theories, researched from a variety of sources</p> <p>(ii) Select and use effectively appropriate computer technology in mathematics and statistics</p> <hr/> <p>(iii) Interpret and apply theories and methodologies from mathematical and statistical literature</p> <hr/> <p>(iv) Identify and design mathematical notation in order to translate a real-world and/or research problem into mathematical and/or statistical language</p> <p>(v) Explain, in the notation appropriate for the</p>

		discipline of mathematics or statistics, how a computation or proof provides evidence for logical statements.
Level of application of knowledge	(i) The ability to assimilate mathematical and/or statistical knowledge beyond the mere repetition of knowledge acquired in courses.	(i) Given a specific application or mathematical problem, identify and justify theories and methodologies relevant to the solution and application of tools and techniques (ii) Develop and evaluate logical arguments in the context of mathematics and/or statistics
Professional capacity/autonomy	(i) Competence in planning and developing an advanced project themed in statistics and/or mathematics <hr/> (ii) Intellectual independence required for continuing professional development in mathematics or statistics <hr/> (iii) Understand ethical issues involved in statistics and/or mathematics <hr/> (iv) Appreciation of the discipline of	(i) Decompose complex tasks, problems or projects into smaller discrete steps, each of which can be analyzed or solved by existing mathematical or statistical tools <hr/> (ii) Work competently and independently; Identify own strengths and differentiate when help and/or additional research is needed (iii) Learn and adapt new mathematical or statistical techniques and explain when these are applicable to the problem at hand. This learning should be done in an independent manner or as part of a team. <hr/> (iv) Discuss and justify how management systems and technologies reflect concern for ethical security and privacy (for streams involved in data analysis) <hr/> (v) Explain the importance and relevance of

	mathematics or statistics	<p>mathematical and/or statistical research, both fundamental and applied.</p> <p>(vi) Discuss the importance of mathematics and/or statistics as the language of scientific discovery</p>
Communication skills	(i) The ability to communicate mathematical and statistical concepts clearly.	<p>(i) Summarize and describe algorithms, theorems, methods, constructions, and definitions; Convey their relevance to possible applications</p> <p>(ii) Present mathematics and statistics in a written and oral form using generally accepted professional practices and notation with standards of quality and clarity of presentation</p>
Awareness of limits of knowledge	(i) Cognizance of the complexity of knowledge and of the potential contributions of other interpretations, methods, and disciplines.	<p>(i) After identifying which methodologies are applicable for a particular problem, critique and/or test the applicability of these methodologies</p> <p>(ii) Identify the dangers involved in misusing/misapplying/mis- interpreting methodology (for applied disciplines)</p> <p>(iii) Given a theoretical result, provide an example or counterexample when a hypothesis is removed.</p>

Ph.D. Graduate degree level expectations and learning outcomes Mathematics and Statistics

Dimensions of Expectations	Degree level expectations of Ph.D. in Mathematics and Statistics	Program learning outcomes
Depth and breadth of knowledge	Thorough understanding of at the foundational areas of modern mathematics and statistics and a deep expertise of a research subject from mathematics or statistics	(i) Demonstrate expertise and ability to apply techniques and methods of the foundational areas of mathematics or statistics (ii) Articulate both the current state of knowledge and history of a research problem in an area of specialization
Research and scholarship	The ability to generate new knowledge or applications at the forefront of mathematics or statistics of a quality to satisfy peer review, and to merit publication.	(i) Identify the goal of a research project and have a clear understanding of the difficulty of the question to be answered (ii) Decompose the larger problem into manageable goals and propose a plan to achieve these goals. Be able to update and revise the plan if the need arises. (iii) Generate the solution or application of of research at the generally accepted level of rigor of the discipline
Level of application of knowledge	The capacity to: (a) undertake pure and/or applied research at an advanced level	(i) Develop techniques, ideas and theories necessary for executing the plan and achieving the goals of the research project.

	(b) contribute to the development of techniques, ideas, theories, approaches.	(ii) Be able to assess the progress and adjust the strategy should the need arise.
Professional capacity/autonomy	<p>(a) Initiative and personal responsibility in development and resolution of complex projects.</p> <p>(b) Intellectual independence required for continuing professional development in mathematics or statistics.</p> <p>(c) The ability to evaluate the broader impacts in society of mathematics or statistics in general, and of the research area in particular.</p>	<p>(i) Work competently and independently and with confidence; Identify own strengths and differentiate when help and/or additional research is needed</p> <p>(ii) Assess the broader impacts of the math/statistic research</p> <p>(iii) Identify the dangers involved in misusing/misapplying/misinterpreting methodology or results (for applied disciplines)</p>
Communication skills	The ability to communicate mathematical and statistical concepts and proofs clearly.	<p>(i) Summarize and describe algorithms, theorems, methods, constructions, and definitions;</p> <p>(ii) Summarize the intuitive idea behind the proof, algorithm or definition.</p> <p>(iii) Present mathematics and statistics in a written and oral form using generally accepted level of rigour and standards of quality and clarity of presentation</p>

Awareness of limits of knowledge	Awareness of the complexity and limitations of knowledge, of the research frontier and of the potential contributions of other methods, and disciplines.	(i) Given a problem, propose and test which methodologies are applicable (ii) Give examples of unsolved problems and discuss the frontier of research in the field of specialization.