RIT | Rochester Institute of Technology

Program Level Outcomes Assessment Plan (PLOAP)

Program Name/College: PhD Mathematical Modeling/College of Science

Program Goal	Student Learning Outcomes	Alignment to the 5 RIT Educational Goals	Data Source/ Measure	Benchmark	Timeline & Person(s) Responsible	Data Analysis & Key Findings	Use of Results Action Items & Dissemination
Develop mathematical models of real-world systems	Define and describe a real-world problem including governing principles; use discipline-specific vocabulary	☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☐ Creative/Innovative Thinking ☒ Integrative Literacies	Graduate Seminar I/II [MATH-606 and MATH-607] - Seminar Summaries	80% of students will achieve a cumulative average grade of B or higher on their seminar summaries	Annually at end of spring semester. Program Director and MATH-606/607 Instructors	*Completed annually by program*	*Completed by program*
			Mathematical Modeling I [MATH-622] - Mid-term Examination or Equivalent	80% of students will achieve a grade of B or higher	Annually at end of fall semester. Program Director and MATH-622 Instructor		
			Mathematical Modeling II [MATH-722] - Mid-term or Equivalent		Annually at end of spring semester. Program Director and MATH-722 Instructor		
	Formulate, analyze, and refine mathematical descriptions of real-world systems, incorporating discipline-specific principles… and comparison with data (where available)	☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	Mathematical Modeling I [MATH-622] - Final Project		Annually at end of fall semester. Program Director and MATH-622 Instructor		
			Mathematical Modeling II [MATH-722] - Final Project		Annually at end of spring semester. Program Director and MATH-722 Instructor		
			Q1* Exam: Modeling Project Component. *First Qualifying Exam	80% of students will pass the qualifying examination	Annually at end of May qualifying exam. Program Director		
Master mathematical concepts and computational techniques	Demonstrate thorough and rigorous knowledge of mathematical concepts relevant to a specific Program Concentration	☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☐ Creative/Innovative Thinking ☐ Integrative Literacies	Q2* Exam. *Second Qualifying Exam	80% of students will pass the qualifying examination	Annually at end of summer semester. Program Director		
	Assess the advantages & limitations of various mathematical approaches; select an approach for, or develop a technique for solving a problem	☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	Q1* Exam: Practical Numerical Analysis Component. *First Qualifying Exam Practical Numerical Analysis Component		Annually at end of May qualifying exam		

	Apply appropriate scientific and high-performance computing methods to solve mathematical problems	☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	High-performance Computing Course Project. Special topics course.	80% of students will achieve an average grade of B or higher	Annually at end of spring semester. Program Director and HPC Course Instructor		
			Numerical Analysis I [MATH-602]. Computational portions of homework		Annually at end of spring semester. Program Director and MATH-602 Instructor		
Demonstrate the ability to conduct research independently	Utilize effective written communication skills in the presentation of research findings	☒ Critical Thinking ☐ Ethical Reasoning ☒ Global Interconnectedness ☒ Creative/Innovative Thinking ☒ Integrative Literacies	Literature review in Graduate Seminar I [MATH-606]	80% of students will achieve a grade of B or higher	Annually at end of fall semester. Program Director.		
		☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☒ Integrative Literacies	Presentation at a Conference	75% of students will give a presentation at a research conference	Annually at end of summer semester. Program Director.		
		☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☒ Integrative Literacies	Thesis Proposal	90% of students will pass the thesis proposal exam			
		☒ Critical Thinking ☐ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☒ Integrative Literacies	Work-in-progress Presentation	80% of students who have passed Q2* exam (second qualifying exam) will give a work-in-progress presentation each year with feedback on research content			
	Formulate and conduct advanced independent research	☒ Critical Thinking ☒ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	Publication	50% of students will be an author or co-author on a peer-reviewed publication			
		☒ Critical Thinking ☒ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	Q2* Exam - Second Year Project. *Second Qualifying Exam	80% of students will pass the qualifying examination			
		☒ Critical Thinking ☒ Ethical Reasoning ☐ Global Interconnectedness ☒ Creative/Innovative Thinking ☐ Integrative Literacies	Work-in-progress Presentation	80% of students who have passed Q2* exam (*second qualifying exam) will give a work-in-progress presentation each year with feedback on research content			