Mathematical, Information and Computer Sciences
Course Learning Outcomes

This is a list of the learning outcomes for all courses in the department. The learning outcomes are tied directly to the specific program learning outcomes related to each course. The classes which are general education are marked with the symbol GE (MTH144, MTH164 and MTH303).

All GE syllabi include the following statement in addition to the learning outcomes:

> This course is one of the components of the General Education Program at Point Loma Nazarene University, under the category of *Developing Cognitive Abilities*. By including this course in a common educational experience for undergraduates, the faculty supports the pursuit of personal awareness and skill development, focusing on the analytical, communicative, and quantitative skills necessary for successful living in society.

CSC133
Students will analyze the interaction between hardware and software.
Students will use the theory of algorithms and computation to solve problems.
Students will use information management as a tool to support decision making in business environments.

CSC143
Students will be able to write correct and robust software.
Students will analyze the interaction between hardware and software.
Students will be able to apply their technical knowledge to solve problems.
Students will collaborate effectively in teams.

CSC153
Students will be able to write correct and robust software.
Students will analyze the interaction between hardware and software.
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC181
Students will be able to use basic features of Excel.
Students will be able to use specific functions that may be useful for their future in areas of business, accounting, and science.

CSC191
Students will have a basic understanding of databases.
Students will learn to use data mining software on data.

CSC252 (Not on the latest curriculum map though in the curriculum for one more year)
Students will be able to write correct and robust software.
Students will use the theory of algorithms and computation to solve problems.
Students will analyze the interaction between hardware and software.
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

Students will collaborate effectively in teams.

CSC254
Students will be able to write correct and robust software.
Students will use the theory of algorithms and computation to solve problems.
Students will analyze the interaction between hardware and software.
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC314
Students will analyze the interaction between hardware and software.
Students will collaborate effectively in teams.

CSC324
Students will be able to write correct and robust software.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC354
Students will be able to write correct and robust software.
Students will use the theory of algorithms and computation to solve problems.
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC374
Students will analyze the interaction between hardware and software.

CSC394
Students will be able to write correct and robust software.
Students will use the theory of algorithms and computation to solve problems.
Students will analyze the interaction between hardware and software.

CSC412
Students will be able to apply their technical knowledge to solve problems.

CSC422
Students will use the theory of algorithms and computation to solve problems.
Students will analyze the interaction between hardware and software.

CSC454
Students will analyze the interaction between hardware and software.
Students will collaborate effectively in teams.

CSC481
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.

Students will be able to write about their work with precision, clarity and organization.

CSC491

Students will achieve the learning objectives set by the instructor. They depend on the material selected for the class.

CSC493

Students will be able to write correct and robust software.
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will analyze the interaction between hardware and software.
Students will collaborate effectively in teams.

CSC496

Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC497

Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

CSC498

Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

CSC499

Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

ISS242

Students will be able to write correct and robust software.
Students will be able to apply their technical knowledge to solve problems.
Students will use information management as a tool to support decision making in business environments.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

ISS324

Students will be able to write correct and robust software.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

ISS414
Students will be able to apply their technical knowledge to solve problems.
Students will analyze the interaction between hardware and software.
Students will use information management as a tool to support decision making in business environments.

ISS424
Students will be able to write correct and robust software.
Students will be able to apply their technical knowledge to solve problems.
Students will analyze the interaction between hardware and software.
Students will collaborate effectively in teams.

ISS472
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

ISS481
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

ISS496
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

ISS497
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

ISS498
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

ISS499
Students will be able to apply their technical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

MTH099
Students will be able to solve basic polynomial equations.

MTH113
Students will be able to solve complicated polynomial equations.
Students will be able to use graphing to solve equations.

MTH121
Students will be able to develop mathematical models for simple problems.
Students will be able to solve these problems using calculus.

MTH123
Students will develop an ability to graph functions including polynomial and trigonometric functions.
Students will develop an ability to solve functions including polynomial and trigonometric functions.

MTH131
Students will be able to use technology to solve problems.
Students will master the fundamentals of using a computer algebra system.
Students will solve calculus problems using a computer algebra system.

MTH133
Students will develop an ability to graph functions including polynomial and trigonometric functions.
Students will develop an ability to solve functions including polynomial and trigonometric functions.

GE MTH144
GE Learning Outcome1A Students will demonstrate effective written and oral communication skills, both as individuals and in groups.

Students will be able to formulate a mathematical model from a verbal description of a problem.

GE Learning Outcome1B Students will use quantitative analysis, qualitative analysis, and logic skills to address questions and solve problems.

Students will be able it solve non-routine problems using logic and quantitative techniques.

Students will be able to construct solutions to problems using computational techniques.

GE MTH164
Students will be able to demonstrate facility with analytical concepts.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

GE Learning Outcome1A Students will demonstrate effective written and oral communication skills, both as individuals and in groups.

Students will be able to formulate a mathematical model from a verbal description of a problem.

GE Learning Outcome1B Students will use quantitative analysis, qualitative analysis, and logic skills to address questions and solve problems.

Students will be able it solve non-routine problems using logic and quantitative techniques.

Students will be able to construct solutions to problems using computational techniques.

MTH174
Students will be able to demonstrate facility with analytical concepts.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH203
Students will be able to apply their technical knowledge to solve problems.
Students will be able to compute measures of central tendency for data.
Students will be able to compute measures of dispersion for data.
Students will be able to use statistical methods to test hypotheses.

MTH213
Students will be able to demonstrate a facility with operations on the integers.
Students will be able to demonstrate a facility with operations on the rational numbers.
Students will be able to apply concepts from number theory to solve problems.

MTH223
Students will be able to construct geometric figures using a compass and straight edge.
Students will be able to compute area and volume.
Students will be able to distinguish between the appropriate uses of probability and statistics to solve problems.

MTH233
Students will be able to apply their mathmatical knowledge to solve problems.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH242
Students will be able to write proofs.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH274
Students will be able to demonstrate facility with analytical concepts.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

GE MTH303

GE Learning Outcome1A Students will demonstrate effective written and oral communication skills, both as individuals and in groups.

Students will be able to formulate a mathematical model from a verbal description of a problem.

GE Learning Outcome1B Students will use quantitative analysis, qualitative analysis, and logic skills to address questions and solve problems.

Students will be able it solve non-routine problems using logic and quantitative techniques.

Students will be able to construct solutions to problems using computational techniques.

MTH333

Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.

MTH343

Students will be able to write proofs.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to apply their mathematical knowledge to solve problems.
Students will use the theory of algorithms and computation to solve problems.

MTH352

Students will be able to write proofs.
Students will be able to demonstrate facility with analytical concepts.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH362

Students will be able to compute measures of central tendency for data.
Students will be able to compute measures of dispersion for data.
Students will be able to use statistical methods to make inferences from data.

MTH373

Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH382

Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will collaborate effectively in teams.

MTH392

Students will be able to apply their technical knowledge to solve problems.
Students will be able to apply their mathematical knowledge to solve problems.

MTH402
Students will be able to demonstrate facility with analytical concepts.
Students will be able to write proofs.
Students will be able to apply their mathematical knowledge to solve problems.

MTH413
Students will be able to demonstrate facility with analytical concepts.
Students will be able to apply their mathematical knowledge to solve problems.

MTH424
Students will be able to demonstrate facility with analytical concepts.
Students will be able to write proofs.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH444
Students will be able to write proofs.
Students will be able to demonstrate facility with algebraic structures.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH463
Students will be able to develop lesson plans to help middle and high school students to learn mathematical concept.
Students will have practice in communicating mathematical concepts to others.

MTH471
Students will be able to demonstrate facility with analytical concepts.
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.

MTH481
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

MTH491
Students will achieve the learning objectives set by the instructor. They depend on the material selected for the class.

MTH492
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH496
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH497
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.
Students will collaborate effectively in teams.

MTH498
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.

MTH499
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.
Students will be able to speak about their work with precision, clarity and organization.
Students will be able to write about their work with precision, clarity and organization.