# ANALYTICAL INQUIRY: NATURAL AND PHYSICAL WORLD COURSES

Mathematics, formal reasoning and, more recently, computational sciences are crucial foundations for many disciplines as they enable and support formal modes of inquiry, particularly for disciplines related to the natural and physical world. For example, today's physics and engineering knowledge would be impossible without accompanying advances in mathematics. Similarly, advances in the life sciences, like genomics, rely heavily on computational sciences. Students must take one course in this area, which is designed to provide all students, regardless of the student's major area of study, the basic knowledge of how to understand and use principles of mathematics and computational sciences as a formal means of inquiry in the natural and physical world.

**COMP 1101 Analytical Inquiry I (4 Credits)**
Students explore the use of mathematics and computer programming in creating animations. Students create animations on their laptop computers using animation software. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement.

**COMP 1201 Introduction to Computer Science I (2 Credits)**
This course introduces the discipline of computer science and how it applies the natural and physical world and society. Topics include the history of computing, computer hardware components, the internet, ethics, and uses computation as a means to analyze, process, model, and understand our world. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Ideally taken concurrently with COMP 1351.

**COMP 1202 Introduction to Computer Science II (2 Credits)**
This course continues the introduction of the discipline of computer science by exploring major areas within it. Topics covered include examples from data structures, algorithms, databases, programming languages, parallel computing, artificial intelligence, robotics, cyber-security, data science, gaming, and ethics. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Prerequisite: COMP 1201.

**COMP 1351 Introduction to Programming I (3 Credits)**
This course is an introduction to fundamental aspects of computer programming. Topics covered include variables, conditional statements, iteration, functions, basic data structures, objects, file input/output and interactions. Satisfies 3 credits of Analytical Inquiry: Natural and Physical World.

**COMP 1352 Introduction to Programming II (3 Credits)**
This course continues to introduce more advanced programming topics using the Python programming language. Topics include classes, types, inheritance, methods/functions, testing, graphical-user interfaces, threads, data manipulation, functional programming, and recursion. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Prerequisite: COMP 1351.

**COMP 1671 Introduction to Computer Science I (4 Credits)**
Characteristics of modern computers and their applications; analysis and solution of problems; structure programming techniques; introduction to classes, abstract data types and object-oriented programming. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Prerequisite: high school algebra.

**MATH 1150 Foundations Seminar (4 Credits)**
The seminars offer challenging and interesting mathematical topics that require only high school mathematics. Examples of seminars are Introduction to Cryptography, Patterns and Symmetry, Mathematical Art and Patterns of Voting. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement.

**MATH 1200 Calculus for Business and Social Sciences (4 Credits)**
This is a one-quarter course for students in business, social sciences, and liberal arts. It covers elementary differential calculus with emphasis on applications to business and the social sciences. Topics include functions, graphs, limits, continuity, differentiation, and mathematical models. Students are required to attend weekly labs. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement.

**MATH 1951 Calculus I (4 Credits)**
Limits, continuity, differentiation of functions of one variable, applications of the derivative. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Prerequisite: MATH 1070 or equivalent.

**MATH 2050 Symbolic Logic (4 Credits)**
Modern propositional logic; symbolization and calculus of predicates, especially predicates of relation. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Cross listed with PHIL 2160.

**PHIL 2040 Practical Logic (4 Credits)**
In this course students will learn how to identify and understand real arguments, the kinds of arguments that they confront everyday in the media, textbooks and periodicals, in addition to those made in philosophical writings. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement.

**PHIL 2160 Symbolic Logic (4 Credits)**
Principles and methods of formal reasoning, their practical and philosophical applications. This course counts toward the Analytical Inquiry: The Natural and Physical World requirement. Cross listed with MATH 2050.