Computing pervades both the economy and contemporary society; a minor in computer science can improve your job prospects and enhance your capacity to contribute to the common good. Providing a background in programming fundamentals, web design and development, databases and data analysis, the minor is a valuable complement to a wide variety of majors in the social and natural sciences and in the humanities.

The various disciplines represented within the Department of Mathematics, Physics and Computer Science are united by their reliance upon:

- methods for discovering and demonstrating patterns, and for constructing structures that exhibit, unify and illuminate these patterns;
- application of these structures to model a wide variety of phenomena in mathematics and the sciences;
- precise language as a means to express patterns and describe structures.

**Minor**

**Eighteen hours required** in the discipline of Computer Science including CSC115, 215, 303, 323, 324, and 405. With permission of the Program Coordinator one course (CSC460 or CSC470) may be substituted for either of CSC324 or CSC405. **Note:** ART323 may be substituted for CSC323.

**115. Computer Science I.** (3 hours) Developing algorithms to solve problems and using the computer as a means to implement algorithms and to automate tasks. The course includes the study of a modern computer language along with the programming paradigms that it represents. Topics include variables, control structures, data structures, objects and reuse of code. **Fall**

**215. Computer Science II.** (3 hours) This course includes the study of the computer language and programming topics begun in CSC 115. It also covers tools and resources available in the larger “eco-system” of the language, and introduces students to development tools, including version control systems. Prerequisite: CSC115. **Fall and Spring**

**303. Fundamentals of Data Computing.** (3 hours) This course focuses on data analysis in settings where the data is so large, dispersed or messy that
machine-processing is required to gather, clean and transform it into forms suitable for analysis. We also study computer-based techniques for the analysis of such data, including machine data visualization and machine-learning. Finally we consider how the practice of reproducible research and the development of interactive web-based applications can enhance communication of the results of data analysis. Prerequisite: MAT111 or CSC115 or PSY211 or permission of the instructor.

323. Web Design. (3 hours) The study of basic front-end web design, including HTML and CSS and other design topics. Possible topics include: CSS frameworks, static site generators, flat content-management systems and elementary JavaScript. ART 323 may be substituted for this course in order to fulfill requirements of the Computer Science minor. Prerequisite: CSC115 or permission of the instructor.

324. Web Programming. (3 hours) The study of one or more web programming languages, and the application of these languages in front-end and back-end web development. Prerequisite: CSC323 or ART323.

405. Database Management. (3 hours) This course introduces database concepts necessary to inform the choice of a database system for applications, and to construct and use a database. At least one type of database system is studied, and is used in both data analysis and web-app development settings. Prerequisites: CSC215 and CSC324.

440. Independent Study. (1-3 hours) As needed

460. Internship. (1-3 hours) Students may receive graduation credit for internships with appropriate disciplinary content that meet the faculty-approved criteria for academic internships. Such experiences include a significant reflective component and must be supervised by a full-time member of the Georgetown College faculty. Prerequisites: CSC115 and consent of the supervising instructor.

470. Topics in Computer Science. (1-3 hours) As needed