Scientific Computing (SCICOMP) Certificate

The Department of Applied Mathematics offers a fully online Scientific Computing Certificate. You will master state-of-the-art methods at the graduate level for using computer-based modeling and simulation to solve complex problems in the physical, biological and engineering sciences. Get an overview of the primary scientific computing tools. Study computing and simulation strategies such as finite difference, finite element and spectral methods. Learn the latest exploratory and objective data analysis methods and how to use predictive analytics techniques. Understand how to implement high-performance computing to solve large-scale problems.

Who Should Apply

Engineering professionals and physical and biological scientists who need to use scientific computing in their work. Civil, electrical, mechanical and aeronautical engineers who want to gain skills in high-performance computing and data analytics. Applicants should hold a bachelor’s degree with prior coursework in calculus, differential equations, linear algebra, and numerical analysis or scientific computing. Applicants should also know MATLAB. Admitted applicants typically have a cumulative GPA of 3.2 or higher.

Curriculum

- **AMATH 581 Scientific Computing**, 5 credits, autumn quarter (starts 9/25/2019)
  Project-oriented computational approach to solving problems arising in the physical/engineering sciences, finance/economics, medical, social, and biological sciences. Problems requiring use of advanced MATLAB routines and toolboxes. Covers graphical techniques for data presentation and communication of scientific results.

- **AMATH 582 Computational Methods for Data Analysis**, 5 credits, winter quarter (starts 1/6/2020)
  Exploratory and objective data analysis methods applied to the physical, engineering, and biological sciences. Brief review of statistical methods and their computational implementation for studying time series analysis, spectral analysis, filtering methods, principal component analysis, orthogonal mode decomposition, and image processing and compression.

- **AMATH 583 High-Performance Scientific Computing**, 5 credits, spring quarter (starts 3/30/2020)
  Introduction to hardware, software, and programming for large-scale scientific computing. Overview of multicore, cluster, and supercomputer architectures; procedure and object oriented languages; parallel computing paradigms and languages; graphics and visualization of large data sets; validation and verification; and scientific software development.

Costs

Course fees are tentatively $1,020/credit plus mandatory fees. (Fees will be finalized summer 2019.) Mandatory fees include a quarterly registration fee of $45 and a technology fee based on the number of registered credits. Thus, your estimated cost per quarter is $5,172. Fees are subject to change.
Application Process & Dates

There are two options to consider when applying for the SciComp certificate:

Certificate Only

If you are not considering applying to our Applied Mathematics master’s degree in the future, you may follow the process below:

- **STEP 1:** Complete the online application. Note that you will be asked to upload a copy of your resume/CV and an unofficial transcript.

- **STEP 2:** We will contact you with an admission decision. If we extend an offer of admission to you, you will complete a registration process with UW Professional & Continuing Education (PCE). Please do not begin this process until you have received a decision from us, as the PCE application fee of $50 is nonrefundable.

**All Due 8/15/2019**

Certificate + Graduate Non-Matriculated (GNM) Status

If you are considering applying to our Applied Mathematics master’s degree in the future, you should apply for both the PCE certificate and GNM status before taking classes. Without securing GNM status, no credits earned for the certificate will be applied to the degree. No exceptions. Additionally, it should be noted that a maximum of two of the three certificate courses may be applied toward the degree. It is recommended that you follow the steps below to apply for the certificate first. That way, if you are not accepted from the certificate you will know not to apply for GNM status, thus saving on application fees and time.

- **STEP 1:** Complete the online application. Note that you will be asked to upload a copy of your resume/CV and an unofficial transcript.

- **STEP 2:** We will contact you with an admission decision. If we extend an offer of admission to you, you will complete a registration process with UW Professional & Continuing Education (PCE). Please do not begin this process until you have received a decision from us, as the PCE application fee of $50 is nonrefundable.

**Step 1 & 2 Due By 8/15/2019**

- **STEP 3:**
  - If you have been notified you were admitted to the certificate, proceed by submitting an Autumn 2018 GNM application online through the UW Graduate School and pay the $75 application fee to the Graduate School.

**Step 3 Due By 9/1/2019**

Keep in Mind

- Students are responsible for having access to MATLAB. MATLAB and Simulink Student Suite can be purchased online for personal computers.

- Any required textbook(s) will be listed on the course syllabus provided at the start of the class.

- We cannot retroactively grant GNM status after the start of a quarter. We cannot retroactively count non-GNM credit toward a MS degree. These are university policies. Please read the above options carefully to choose the appropriate path.

- Students must earn a 2.7 or higher in each class in order to earn the certificate. However, students should aim to earn a 3.2 or
higher if they are thinking of eventually applying to the degree program.

- Students already matriculated into a full UW degree program are not eligible to apply for the SciComp certificate.
- Please email gpa@amath.washington.edu with any questions

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