

Data-Enabled Computational Engineering and Science

The Data-Enabled Computational Engineering and Science (DECES) program targets students with recently obtained Bachelor of Science (BS) degrees in Engineering, Applied Mathematics, Computer Science, Physical Sciences, and related disciplines, who are interested in pursuing careers that involve advanced modeling and simulation in engineering and physical sciences. This program will also be of interest to research staff as well as working professionals whose success on the job depends on their ability to perform high-fidelity engineering simulations with data assimilation. Data-Enabled Computational Engineering and Science is an inherently interdisciplinary field requiring in-depth knowledge of advanced mathematics, numerical methods and their computer implementation, engineering sciences, and methods in the emerging field of Data Science. Given the composition of Brown's School of Engineering and Applied Math faculty, we are uniquely positioned to offer such a program using a combined Engineering and Applied Math graduate curriculum.

Program Requirements:

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| Two courses in Engineering, such as: | 2 |
| ENGN 1750 | Advanced Mechanics of Solids |
| ENGN 2020 | Mathematical Methods in Engineering and Physics II |
| ENGN 2210 | Continuum Mechanics |
| ENGN 2220 | Mechanics of Solids |
| ENGN 2340 | Computational Methods in Structural Mechanics |
| ENGN 2410 | Thermodynamics of Materials |
| ENGN 2520 | Pattern Recognition and Machine Learning |
| ENGN 2810 | Fluid Mechanics I |
| ENGN 2820 | Fluid Mechanics II |
| ENGN 2930 | Atomistic Modeling of Materials |
| Two courses in Applied Mathematics, such as: | 2 |
| APMA 1690 | Computational Probability and Statistics |
| APMA 2550 | Numerical Solution of Partial Differential Equations I |
| APMA 2560 | Numerical Solution of Partial Differential Equations II |
| APMA 2580A | Computational Fluid Dynamics |
| APMA 2630 | Theory of Probability I |
| APMA 2822B | Introduction to Parallel Computing on Heterogeneous (CPU+GPU) Systems |
| Two courses in data science/high performance computing | 2 |
| Two additional courses. To ensure depth these may be taken in Engineering, Applied Mathematics, Data Science, or other relevant disciplines. | 2 |
| Total Credits | 8 |

For more information on admission and program requirements for the Data-Enabled Computational Engineering and Science program, please visit <https://computational.engineering.brown.edu/>

Please view sample course plans based on Sc.M. Thesis or Non-Thesis and Curriculum options at <https://computational.engineering.brown.edu/program-and-schedule> (<https://computational.engineering.brown.edu/program-and-schedule/>)