GEORGE MASON UNIVERSITY | Korea

Department of Computational and Data Sciences
데이터과학과

BS Degree in Computational and Data Sciences

In a world driven by data, university graduates with a solid knowledge base in data and computations have a distinct edge in the job market.

한국조지메이슨대학교 데이터과학과(이학사) 학부 과정

데이터 중심의 세계에서 데이터 활용에 대한 탄탄한 지식 기반을 갖춘 졸업자는 데이터과학 분야에서 우수한 경쟁력을 갖춘 인재로 성장할 수 있습니다.

PROGRAM DESCRIPTION

The aim of the BS in computational and data sciences (CDS) is to provide students with the technical skill set and knowledge to rigorously investigate social and physical phenomena. Students will achieve this in two ways.

The first is the systematic development and application of computational techniques for modeling and simulation of scientific phenomena or social processes.

The second is the systematic development and application of techniques for mining, managing, and analyzing large sets of data. This approach is highly interdisciplinary and will lead to comprehension, interpretation, and prediction of phenomena that traditional theory or experiment alone cannot provide.

‘데이터과학이란?’

데이터과학(Computational and Data Sciences) 학부 과정의 목표는 학생들이 사회적 및 물리적 현상을 정밀하게 분석 할 수 있는 기술적 툴과 지식을 습득하는 것입니다. 학생들은 과학적/사회적 현상을 모델링 및 시뮬레이션을 통한 예측 및 적용할 수 있는 기술을 다룰 뿐만 아니라 대규모 데이터를 체계적으로 마이닝, 관리 및 분석하는 능력도 함께 발전시킬 수 있습니다. 데이터과학은 심도 깊은 학제 간 연구를 통해 다양한 학문과 연계를 할 수 있으며, 전통적인 이론이나 실험을 기반하여 밝힐 수 없는 사회적 현상들에 대한 이해, 해석 및 예측이 가능합니다.

WHY CDS?

The educational and research directions pursued in the CDS degree are focused on providing our students with skills to be competitive in neighboring federal laboratories, scientific institutions, and high-technology firms and is a reflection of the present central role of computation in the arenas of “big data,” as well as modeling and simulation.

‘왜 데이터과학인가?’

데이터과학 학부 과정은 학생들에게 연방 연구소, 과학 기관/첨단 기술 분야에서 경쟁력을 갖출 수 있도록 교육 및 연구에 초점을 맞추고 있습니다. 이 외에 "빅데이터" 뿐만 아니라, 데이터를 기반으로 한 모델링 및 시뮬레이션을 위한 기술을 개발하고 이를 활용할 수 있는 능력을 키울 수 있습니다.

askmk@gmu.edu
032-626-5021 / 010-9103-6001
masonkorea.gmu.edu

College of Science
cos.gmu.edu

Program Courses

A. CDS Core Required Courses—16 credits

- CDS 130 Computing for Scientists (3)
  (Included in the Mason Core)
- CDS 151 Data Ethics in an Information Society (1)
  (Included in the Mason Core)
- CDS 230 Modeling and Simulation I (3)
- CDS 301 Scientific Information and Data Visualization (3)
- CDS 302 Scientific Data and Databases (3)
  (Writing-intensive course)
- CDS 303 Scientific Data Mining (3)

B. CDS Required Extended Core—choose at least 18 credits from the following courses:

- CDS 101 Introduction to Computational and Data Sciences (3) (Included in the Mason Core) and CDS 102 Introduction to Computational and Data Sciences Lab (1) (Included in the Mason Core)*
- CDS 201 Introduction to Computational Social Science (3)
- CDS 205 Introduction to Agent-based Modeling and Simulation (3)
- CDS 251 Introduction to Scientific Programming (3)
- CDS 290 Topics in Computational and Data Sciences (1-4)
- CDS 292 Introduction to Social Network Analysis (3)
- CDS 411 Modeling and Simulation II (3)
- CDS 486 Topics in Computational and Data Sciences (3)
- CSI 500 Computational Science Tools (3)
- CSI 501 Introduction to Scientific Programming (3)

* CDS 101 and 102 must be taken together in order to count towards the Extended Core.

CDS Elective Course Suggestions

- CDS 410/MATH 447 Numerical Analysis II (3)
- CDS 421 Introduction to Computational Fluid Dynamics (3)
- CDS 461 Molecular Dynamics and Monte Carlo Simulations (3)
- CDS 487 Electronic Structure Computations (3)
- CDS 490 Directed Study and Research (1-3)
- CDS 491 Internship (1-3)

C. Mathematics—choose at least 10 credits from the following courses:

- MATH 113 Analytic Geometry and Calculus I (4)
  (Included in the Mason Core)
- MATH 114 Analytic Geometry and Calculus II (4)
- MATH 125 Discrete Mathematics I (3)
- MATH 203 Linear Algebra (3)
- MATH 446 Numerical Analysis I (3)

D. Statistics—choose 6 credits from the following courses:

- STAT 250 Introductory Statistics I (3) (Included in the Mason Core)
- STAT 350 Introductory Statistics II (3)
- STAT 344 Probability and Statistics for Engineers and Scientists I (3)
- STAT 346 Probability for Engineers (3)

E. Science and Engineering—choose 6 additional credits of science or engineering courses:

- Additional Mason Core: https://catalog.gmu.edu/mason-core/#information-technology

F. Mason Core and Elective Credits—63-64 credits

In order to meet a minimum of 120 credits, this degree requires an additional 63-64 credits, which may be applied toward any remaining Mason Core requirements, requirements for bachelor's degrees, and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

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