DATA ANALYTICS

Data Analytics Major

The major in Data Analytics (DA) requires a minimum of 46 credits of coursework and an approved summer experience. The detailed requirements are organized in three parts, as follows.

(a) First, students must complete the following 34 credits of core coursework:

Code	Title
DA 101	Introduction to Data Analytics
CS 109	Discovering Computer Science
or CS 111	Discovering Computer Science: Scientific Data and Dynamics
or CS 112	Discovering Computer Science: Markets, Polls, and Social Networks
MATH 135	Single Variable Calculus
or MATH 145	Multi-variable Calculus
DA 200	Data Analytics Colloquium (once as a sophomore and once as a junior or senior, 2 credits total)
DA 210/CS 181	Data Systems
DA/MATH 220	Applied Statistics
DA 301	Practicum in Data Analytics
DA 350	Advanced Methods for Data Analytics
DA 401	Seminar in Data Analytics

(b) Second, students must complete a DA summer experience (internship or research project). This experience must be approved by the Data Analytics Program Committee, and is normally undertaken during the summer before the senior year.

(c) Third, students must acquire some depth in a domain of Data Analytics. They will then carry this disciplinary knowledge into their summer experience and senior seminar. Students may satisfy this requirement in one of two ways. First, they may choose to take the designated set of courses from one of the following departments.

Code	Title
Anthropology and Sociology (3 courses)	
Only students who matriculated prior to the Fall of 2023 may choose to graduate with an Anthropology/Sociology (ANSO) Data Analytics Concentration. The ANSO Data Analytics Concentration is not offered to students who matriculated Fall 2023 or thereafter.	
ANSO 100	People, Culture and Society
ANSO 343	Demography of Africa
OR any ANSO 300-level course pending approval by DA chair	
ANSO 351	Survey Research Methods
Biology (4 courses)	
BIOL 210	Molecular Biology and Unicellular Life
BIOL 220	Multicellular Life
BIOL 230	Ecology and Evolution
and one of the following:	
BIOL 309	Computational Biology
BIOL 345	Eukaryotic Cell Biology (Dr. Yoo only)
BIOL 350	Genomics
BIOL 356	Special Topics (Biostatistics)
Economics (4 courses)	
ECON 101	Introductory Macroeconomics
ECON 102	Introductory Microeconomics
ECON 302	Intermediate Microeconomic Analysis
ECON 467	Econometrics II (requires ECON 307 or DA 220/ MATH 220)
Earth and Environmental Sciences (4 courses)	
EESC 111	Planet Earth
Either	
EESC 234	Applied GIS for Earth and Environmental Sciences
Or	
EESC 222 & EESC 223	Geographic Information Systems I and Geographic Information Systems II
And one of the following:	
EESC 200	Environmental Geology
EESC 210	Historical Geology
EESC 211	Rocks, Minerals & Soils
And one of the following:	
EESC 300	Geomorphology
EESC 310	Global Biogeochemical Cycles
EESC 311	Structural Geology
EESC 313	Environmental Hydrology
EESC 314	Sedimentology & Stratigraphy
EESC 333	Stable Isotopes in the Environment
Environmental Studies (4 courses)	
ENVS 100	Integrated Environmental Studies
ENVS 200	Environmental Analysis
And one of the following:	
ENVS 215	Renewable Energy Systems
EESC 234	Applied GIS for Earth and Environmental Sciences
ENVS 222 & ENVS 223	Geographic Information Systems I and Geographic Information Systems II
ENVS 240	Environmental Politics and Decision Making
ENVS 274	Ecosystem Management
And one the following:	
ENVS 236	Political Ecology
ENVS 256	Farmscape: Visual Immersion in the Food System
ENVS 262	Environmental Dispute Resolution
ENVS 284	Environmental Planning and Design
ENVS 334	Sustainable Agriculture
Philosophy (3 courses)	
PHIL 121	Ethics: Philosophical Considerations of Morality
or PHIL 126	Social and Political Philosophy
PHIL 205	Logic
PHIL 210	Philosophy of Science
Physics (3 courses)	
Either:	
PHYS 121 & PHYS 122	General Physics I and General Physics II
Or	

PHYS 125 & PHYS 126 & PHYS 127	Principles of Physics I: Quarks to Cosmos and Principles of Physics II and Principles of Physics III
PHYS 312	Experimental Physics
Psychology (3 courses)	
PSYC 100	Introduction to Psychology
PSYC 200	Research Methods and Statistics
PSYC 2XX/3XX	Psychology elective (except research courses, 370, 410, 361-364, 451-452)

Alternatively, a student may submit an individualized 3-4 course domain elective plan, which must include at least one analytics-intensive course, to be considered for approval by the Data Analytics Program Committee. A successful one-page proposal will clearly describe the student's desired learning goals and how the proposed courses together achieve these goals. The proposal should also demonstrate the feasibility of completing the proposed courses in the time remaining before graduation. Proposals must be submitted prior to the end of the sophomore year.

Additional Points of Interest

Data Analytics majors wishing to study abroad should do so in the spring semester of their junior year. Data Analytics courses are not normally taken at other institutions, although on rare occasions, a suitable substitute may be found for DA 350 - Advanced Methods for Data Analytics.

If a student uses AP credit to skip a course in their chosen domain area, that course must be replaced with a suitable substitute, determined in cooperation with the appropriate department.

We recommend that students who wish to acquire deeper technical skills in data analytics and/or prepare for graduate work in data science, take additional courses in Mathematics and Computer Science. In Mathematics, students should begin by taking MATH 145 - Multi-variable Calculus and MATH 213 - Linear Algebra and Differential Equations. In Computer Science, students may take CS 173 - Intermediate Computer Science, CS 234 - Mathematical Foundations of Computer Science, and CS 271 - Data Structures. Beyond these, students may pursue additional advanced courses such as

Code	Title
CS 337/MATH 415	Operations Research
CS 339	Artificial Intelligence
CS 345	Parallel Systems and Programming
CS 377	Database Systems
MATH 425	Applied Probability
MATH 435	Mathematical Modeling

Students may also pursue a minor or second major in Computer Science or Mathematics. Due to some course overlaps, these options require only 6-7 additional courses.