BACHELOR OF SCIENCE (BS) DATA ANALYTICS: COMPUTATIONAL ANALYTICS SPECIALIZATION

Major Prerequisites (16 hours)

These courses may overlap with the General Education curriculum where appropriate. Courses in **BOLD** should be completed before submitting an application to the Data Analytics major. Online options may be available for courses marked ●. Please refer to the ASC General Education course list for GE online courses.

Department	Course	Hours	Term Offered
Math	**Math 1151** ● (1161 or 1181H) – Calculus I	5	AU/SP/SU
	Math 1152 ●(1172, 2162 or 2182H) – Calculus II	5	AU/SP/SU
Computer Science & Engineering	***CSE 1223** – Computer Programming in Java	3	AU/SP/SU
Linguistics	****LING 2000 ●– Intro to Language in the	3	AU/SP

*CSE 1222 or CSE placement level A can also fulfill this prerequisite; however, 1223 is *strongly* preferred.

*LING 2000 is only required for students pursuing the Linguistics and Text Analytics Focus, but it can fulfill the Cultures & Ideas GE for any Data Analytics major, regardless of specialization or focus.

Core Requirements (51 hours)

The Data Analytics Core courses follow a strict pre-requisite structure. Some courses are only offered once per year. Failure to successfully enroll in and complete these courses will delay graduation.

Department	Course	Hours	Term Offered
Math	Math 2568 ● – Linear Algebra	3	AU/SP/SU
Industrial & Systems Engineering	ISE 3230 – Systems Modeling and Optimization	3	AU
Computer Science & Engineering	**CSE 2221** – Software I: Software Components	4	AU/SP/SU
	CSE 2231 – Software II: Development & Design	4	AU/SP/SU
	CSE 2321 – Foundations I: Discrete Structures	3	AU/SP/SU
	CSE 2421 or 3430 – Systems I: Computer Systems	4	AU/SP/SU
	CSE 3241 – Databases I: Computer Architecture	3	AU/SP/SU
	CSE 3244 or 5242 – Adv. DB & Cloud Computing	3	AU/SP
	CSE 5243 – Data Mining	3	AU/SP
	CSE 5544 or ISE 5760 – Data Visualization	3	AU/SP
Statistics	STAT 3201 – Probability for Data Analytics	3	AU/SP
	STAT 3202 – Statistical Inference for Data Analytics	4	AU/SP
	STAT 3301 – Statistical Modeling for Discovery I	3	AU
	STAT 3302 – Statistical Modeling for Discovery II	3	SP
	STAT 4620 – Statistical Learning	2	AU
	STAT 3303 – Statistical Decision Making	3	SP

Computational Analytics Specialization (14 hours)

Course	Hours	Term Offered
CSE and LING Electives – Choose 10 hours from back of sheet	10	varies
CSE 59xx/STAT 4911 – Capstone in CSE or Data Analytics **(Senior year)**	4	AU/SP

GENERAL EDUCATION

Please visit http://artsandsciences.osu.edu/academics/current-students/advising/ge for a list of the General Education curriculum requirements.

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Students majoring in Computational Analytics must take **10 credit hours** of coursework from the electives listed below. Courses are grouped to show possible focus areas but **students may select any combination of** courses (assuming pre-requisites have been met).

ELECTIVES: CYBER-SECURITY FOCUS			
COURSE	TITLE	HOURS	PREREQUISITES
CSE 3461	Computer Networking and Internet Technologies	3	CSE 2421. Concur: CSE 2431
CSE 4471	Information Security	3	CSE 2231 & 2321
CSE 5472 OR 5473	Info Security Projects OR Network Security	3	CSE 3901 or 3902 or 3903 OR 3461

ELECTIVES: MACHINE INTELLIGENCE FOCUS			
COURSE	TITLE	HOURS	PREREQUISITES
CSE 2331	Foundations II	3	CSE 2231 & 2321 & STAT 3202
CSE 3521	Survey of Artificial Intelligence I	3	CSE 2331
Choose *two* of the following:			
CSE 5245	Intro to Network Science	3	CSE 2331
CSE 5523	Machine Learning and Statistical Pattern Recognition	3	CSE 3521 & STAT 3202
CSE 5524	Computer Vision for Human-Computer Interaction	3	CSE 2331
CSE 5526	Intro to Neural Networks	3	CSE 3521 or 5521

ELECTIVES: CORE (SYSTEMS OR THEORY) FOCUS			
COURSE	TITLE	HOURS	PREREQUISITES
CSE 2331	Foundations II: Structures & Algorithms	3	CSE 2231 & 2321 & STAT 3202
CSE 2431	Systems II: Operating Systems	3	CSE 2421
CSE 3901/ 3902/3903	CSE Junior Project Choice	4	CSE 2231 & 2321 & 2421 or 3430
Choose *one* of the following:			
CSE 5245	Intro to Network Science	3	CSE 2331
CSE 5361	Numerical Methods	3	CSE 2231 & MATH 2568
CSE 5441	Intro to Parallel Computing	3	CSE 2231 & 2321 & 2421 or 3430 & MATH 2568

ELECTIVES: LINGUISTICS AND TEXT ANALYTICS FOCUS			
COURSE	TITLE	HOURS	PREREQUISITES
LING 5801	Computational Linguistics I	3	LING 3802 & 5000 & CSE 3321 & 3521 or 5052
LING 5802	Computational Linguistics II	3	LING 5801
CSE 5525	Foundations of Speech and Language Processing	3	CSE 3521 & STAT 3202
Choose *one* of the following:			
LING 4100	Phonetics	3	LING 2000
LING 4200	Syntax	3	LING 2000
LING 4300	Phonology	3	LING 2000
LING 4400	Linguistic Meaning	3	LING 2000