Data Science
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Two–Year Visiting Associate Professor: Marcus Birkenkrahe

Data is being generated at all times, arriving from multiple sources at an incredible rate. Nearly every device connected to the internet is generating data, and those capable of analysis and study of it is increasingly in demand. The ongoing generation of "big data" has resulted in a new job market: business leaders, scientists, engineers and leaders in all walks of life have realized that they need scientists with the knowledge and ability to analyze, and understand the implications of the data and then communicate their findings. In addition to the data that is being constantly generated through modern commercial use of the internet, an abundance of data has been in existence for some time. The proper study and understanding of the implications of this data is increasingly important.

The Lyon College Data Science program will provide students with the theoretical background and initial problem-solving experiences focusing on three general broad areas: science, business and economics, and social sciences and humanities.

Program: Data Science

SUMMARY OF REQUIREMENTS FOR A MAJOR IN DATA SCIENCE

COMPUTER SCIENCE CORE COMPETENCE

Item #	Title	Credits
	CSC 100 or CSC 115	3
MTH 115	Discrete Mathematics	3
CSC 245	Introduction to Digital Logic	3
CSC 265	Algorithms	3
CSC 330	Database Theory and Application	3
	Sub-Total Credits	15

MATH CORE COMPETENCE

Item #	Title	Credits
MTH 210	Calculus I	4
MTH 220	Calculus II	4
MTH 330	Linear Algebra	3
	MTH 360 or BUS 323	3
	CSC 415 or MTH 415	3
	Sub-Total Credits	17

DATA SCIENCE CORE COMPETENCE

DATA SCIENCE SPECIALIZATION – TWO COURSES

Item #	Title	Credits
DSC 302	Data Visualization	3
DSC 401	Data Science Applications and Programming	3
DSC 450	Data Science Independent Study	3
DSC 482	Data Science Special Topics	3
	Sub-Total Credits	6

REQUIREMENTS FOR SCIENCE TRACK

Item #	Title	Credits
	Data Science Elective Group - Science Track	9 - 12
	Data Science Independent Study Lab	3
	Sub-Total Credits	12-15

REQUIREMENTS FOR BUSINESS & ECONOMICS TRACK

Item #	Title	Credits
	Data Science Elective Group - Business & Economics Track	15
	Sub-Total Credits	15

REQUIREMENTS FOR SOCIAL SCIENCES/HUMANITIES/FINE ARTS TRACK

Item #	Title	Credits
CSC 105	Digital Humanities	3
	Data Science Independent Study Lab	3
	Data Science Elective Group - Social Sciences/Humanities/Fine Arts	6
	Sub-Total Credits	12

	Total credits:	60-63

CATEGORY DESCRIPTIONS

CSC 100 or CSC 115

Item #	Title	Credits
CSC 100	Introduction to Programming in C++	3
CSC 115	Introduction to Programming in Java	3
	Sub-Total Credits	6

MTH 360 or BUS 323

Item #	Title	Credits
MTH 360	Probability and Statistics	3
BUS 323	Statistical Applications to Business Decision Making	3
	Sub-Total Credits	6

CSC 415 or MTH 415

Item #	Title	Credits
CSC 415	Numerical Analysis	3
MTH 415	Numerical Analysis	3
	Sub-Total Credits	6

Data Science Elective Group – Science Track

The student will take three science classes 200 level or above.

The student will enroll in DSC 450, 1 hour, and participate in a course–related project under the supervision of the advisor and the professor for each class.

SCIENCE TRACK ELECTIVES

Item #	Title	Credits
BIO 220	General Botany	4
BIO 222	Zoology	4
BIO 250	Cell Biology	4

BIO 260	Human Anatomy and Physiology I	4
BIO 262	Human Anatomy and Physiology II	4
BIO 340	Ecology	4
BIO 345	Speleology	4
BIO 350	Microbiology	4
BIO 352	Molecular Biology	4
BIO 356	Biochemistry	4
BIO 366	Histology	4
BIO 370	Evolution	3
BIO 382	Special Topics in Biology	3 - 4
BIO 420	Advanced Topics in Biology	3 - 4
BIO 425	Advanced Biochemistry	4
CHM 210	Organic Chemistry I	4
CHM 220	Organic Chemistry II	4
CHM 224	Quantitative Analysis	4
CHM 302	Instrumental Analysis	4
CHM 304	Environmental Chemistry	4
CHM 350	Chemical Thermodynamics and Kinetics	4
CHM 356	Biochemistry	4
CHM 360	Quantum Chemistry and Spectroscopy	4
CHM 413	Advanced Inorganic Chemistry	4
CHM 425	Advanced Biochemistry	4
CHM 482	Topics in Chemistry	3
PHY 210	General Physics I	3
PHY 211	General Physics I Laboratory	1
PHY 220	General Physics II	3
PHY 221	General Physics II Laboratory	1
PHY 240	Fundamentals of Physics I	3
PHY 241	Fundamentals of Physics I Laboratory	1
PHY 250	Fundamentals of Physics II	3
PHY 251	Fundamentals of Physics II Laboratory	1
PHY 282	Special Topics in Physics	3
PHY 335	Modern Physics	3
PHY 382	Special Topics in Physics	3
	Sub-Total Credits	125-127

Data Science Independent Study Lab

For each class, the student will take a DS lab (1 hour) with a course related project.

INDEPENDENT STUDY LAB

Item #	Title	Credits
DSC 450	Data Science Independent Study	3
	Sub-Total Credits	3

Data Science Elective Group – Business & Economics Track

The student will meet requirements for a minor in Business of Economics <u>OR</u> complete the following classes:

BUSINESS & ECONOMICS TRACK

Item #	Title	Credits
ECO 101	Principles of Economics I	3
ECO 102	Principles of Economics II	3
ACC 210	Principles of Accounting I	3
ACC 211	Principles of Accounting II	3
ECO 306	Econometrics	3
	Sub-Total Credits	15

Data Science Elective Group – Social Sciences/Humanities/Fine Arts

With approval from your advisor and the professor for each class, the student will complete the following Social Science/Humanities/Fine Arts classes.

The student will take two classes from either Social Science, Humanities, or Fine Arts division.

For each class, the student will take a DS lab (1 hr) with a course related project.

SOCIAL SCIENCE/HUMANITIES/FINE ARTS TRACK

Item #	Title	Credits
RPH 210	The Legacy of Ancient Greek Civilization in the Era of Globalization	3

RPH 306	Logic	3
RPH 310	Philosophy of Art	3
RPH 320	Christian Ethics	3
RPH 325	Jesus and the Gospels	3
RPH 329	The Early Church	3
RPH 335	Women's Issues	3
RPH 337	Plato's Dialogues	3
RPH 350	Business and Professional Ethics	3
RPH 351	Ancient Political Philosophy	3
RPH 353	Modern Political Philosophy	3
RPH 360	Introduction to Contemporary Critical Theory	3
RPH 362	Environmental Ethics	3
RPH 365	Topics in Religion	3
RPH 370	Topics in Philosophy	3
RPH 470	Advanced Seminar: In-depth Study of Religion and Philosophy	3
POL 201	Comparative Politics	3
POL 205	World Politics	3
POL 210	Introduction to Legal Studies	3
POL 220	Introduction to Research Methods in Political Science	3
POL 250	Political Issues and Public Policy	3
POL 288	Political Parties, Campaigns & Elections	3
POL 297	International Conflict	3
POL 302	Arkansas State and Local Government	3
POL 315	U.S. Foreign and Security Policy	3
POL 325	American Political Institutions	3
POL 346	International Law and Organizations	3
POL 349	The German Political and Cultural Tradition	3
POL 351	Ancient Political Philosophy	3
POL 353	Modern Political Philosophy	3
POL 358	Modern Russia	3
POL 368	Asian Politics	3
POL 370	Political Economy of Public Issues	3
POL 371	The Middle East	3
POL 380	Civil Liberties	3
POL 382	Special Topics in Political Science	3
POL 455	Senior Seminar	3

HIS 280	Historiography and the Historical Method	3
HIS 301	British History I	3
HIS 302	British History II	3
HIS 303	History of Ireland	3
HIS 304	History of Scotland	3
HIS 305	Britain and the British Empire	3
HIS 306	Celtic World in Film	3
HIS 307	Scottish Enlightenment	3
HIS 308	Topics in Scottish and Irish Studies	3
HIS 310	Colonial America	3
HIS 312	Founding America	3
HIS 325	History and Film	3
HIS 334	Recent European History	3
HIS 340	The French Revolution and Napoleon	3
HIS 353	The Evolution of War	3
HIS 355	The Reformation	3
HIS 356	The Spanish Golden Age	3
HIS 357	Early Modern France	3
HIS 361	The Civil War	3
HIS 367	Life in 20th Century America	3
HIS 382	Special Topics in History	3
HIS 470	Celtic Studies Research	3
HIS 480	Senior Seminar	3
ANT 205	Human Origins	3
ANT 282	Special Topics	3
ANT 307	Ethnographic Methods	3
ANT 320	Human Variation and Adaptation	3
ANT 323	Globalization	3
ANT 331	Gender and Culture	3
ANT 382	Special Topics in Anthropology	3
ENG 203	Classical Mythology and Literature	3
ENG 209	Welsh Mythology	3
ENG 210	Studies in Fiction	3
ENG 211	Introduction to Poetry	3
ENG 212	Topics in Literature	3
ENG 215	Introduction to Shakespeare	3
ENG 290	Survey of British Literature I	3

ENG 291	Survey of British Literature II	3
ENG 323	Nineteenth Century British Poetry	3
ENG 330	American Literature to 1900	3
ENG 331	American Literature from 1900	3
ENG 333	Modern Poetry	3
ENG 334	American Fiction of the 20th Century	3
ENG 335	British Fiction	3
ENG 337	Advanced Grammar	3
ENG 340	Film Studies	3
ENG 363	Advanced Composition	3
ENG 365	Introduction to Contemporary Critical Theory	3
ENG 366	Topics in Critical Theory	3
ENG 433	Nineteenth-century British Literature	3
ENG 441	Shakespeare	3
ENG 442	Faulkner	3
ENG 443	Major Writers	3
FMS 382	Special Topics in Film and Screen Cultures	3
FRN 315	Advanced Grammar and Composition	3
FRN 320	French Linguistics and Phonetics	3
FRN 340	Eighteenth-century French Studies	3
FRN 345	Nineteenth-century French Studies	3
FRN 350	Twentieth-century French Studies	3
FRN 355	Contemporary France	3
FRN 382	Special Topics in French	3
JRN 203	News Writing	3
JRN 303	News Editing	3
JRN 382	Special Topics in Journalism	3
SPN 315	Introduction to Spanish Linguistics	3
SPN 333	Advanced Grammar and Composition	3
SPN 335	Hispanic Cinema	3
SPN 360	Hispanic Culture and Civilization	3
SPN 378	Introduction to Peninsular and Latin American Literature I	3
SPN 379	Introduction to Peninsular and Latin American Literature II	3
SPN 382	Special Topics	3
SPN 385	Studies in the Spanish Golden Age and Baroque	3
SPN 405	Studies in Nineteenth-century Peninsular Literature	3
SPN 406	Studies in Twentieth-century Peninsular Literature	3

SPN 410	20th Century Latin American Prose Fiction	3
SPN 415	U.S. Latino Literature	3
MUS 205	Advanced Music Theory	3
MUS 263	Ceol Mor I (classical Bagpipe I)	3
MUS 291	Topics in Music History	3
MUS 292	Topics in Music Theory	3
MUS 293	Topics in Performance Practice	3
MUS 295	World Music	3
MUS 296	Bach's Germany	3
MUS 311	Medieval and Renaissance Music	3
MUS 320	Baroque and Classical Music	3
MUS 325	Nineteenth- and Twentieth-century Music	3
MUS 330	Hymnody	3
MUS 363	Ceol Mor II (classical Bagpipe II)	3
MUS 420	Conducting	3
MUS 430	Church Music	3
MUS 431	Vocal Pedagogy	3
MUS 432	Instrumental Pedagogy	3
MUS 433	Keyboard Pedagogy	3
MUS 463	Ceol Mor III (classical Bagpipe III)	3
ART 220	Digital Studio I	3
ART 230	History of Modern Art	3
ART 282	Special Topics in Art	3
ART 299	Art in Context	1
ART 308	Renaissance Art	3
ART 340	Film Studies	3
ART 382	Special Topics in Art	3
	Sub-Total Credits	412