

Data Sciences
Application Focus Course Listings

Select a minimum of 12 credits from each focus area; at least two must be at the 4xx level. Students may also propose a custom application focus, with guidance and approval by the program coordinator for the Option.

LIFE SCIENCES

BMB 251 Molecular and Cell Biology I	Prerequisite: CHEM 112	3 credits
BIOL 322 Genetic Analysis	Prerequisite: none	3 credits
MICRB 201 Intro to Microbiology	Prerequisite: CHEM 110	3 credits
BMB 252 Molecular and Cell Biology II	Prerequisite: BMB 251	3 credits
BMB 400 Molecular Biology of the Gene	Prerequisite: BIOL 322, BMB 251, and CHEM 212	2 credits
BMB 401 General Biochemistry I	CHEM 210, and BMB251	3 credits
BMB 402 General Biochemistry II	BMB 401	3 credits
BMB 482 Introduction to Computational Biology	Prerequisite: none	3 credits
BMB 484 Functional Genomics	Prerequisite: BMB 251 and BIOL 322	3 credits
BMB 485 Human Genomics and Biomedical Informatics	Prerequisite: BIOL 322 and BMB 400	3 credits

HEALTH SCIENCES

BBH 101(GHA) Introduction to Biobehavioral Health	Prerequisite: none	3 credits
BBH 203 Neurological Bases of Human Behavior	Prerequisite: none	3 credits
BBH 305 Introduction to Global Health Issues	Prerequisite: BBH 101	3 credits
BBH 310 Research Strategies for Studying Biobehavioral Health	Prerequisite: BBH 101	3 credits
BBH 311 Interdisciplinary Integration in Biobehavioral Health	Prerequisite: BBH 101, BIOL 110, PSYCH 100	3 credits
BBH 315 Gender and Biobehavioral Health	Prerequisite: BBH 101	3 credits
BBH 316 Foundations and Principles of Health Promotion	Prerequisite: BBH 101	3 credits
BBH 368 Neuroanatomy, Behavior, and Health	Prerequisite: BBH 101 and BIOL 141	3 credits
BBH 410 Developmental and Health Genetics	Prerequisite: BIOL 133 or BIOL 222	3 credits
BBH 432 Biobehavioral Aspects of Stress	Prerequisite: BBH 101, BIOL 141, BBH 310 or equivalent	3 credits
BBH 440 Principles of Epidemiology	Prerequisite: BBH 101	3 credits
BBH 446 Human Sexuality as a Health Concern	Prerequisite: BBH 101	3 credits
BBH 451 Pharmacological Influence on Health	Prerequisite: BBH 101, BIOL 141, PSYCH 100	3 credits
BBH 452 Women's Health Issues	Recommended Preparation: BIOL 141	3 credits
BBH 469 Neurobiology	Prerequisite: BIOL 240W	3 credits

NUTRITION

BMB 211 Elementary Biochemistry	Prerequisite: CHEM 202 or CHEM 210	3 credits
NUTR 211R Applying Biochemistry to Nutrition	Prerequisite: CHEM 110, CHEM 202, CHEM 210; co-requisite: BMB 211	2 credits
NUTR 251 Introductory Principles of Nutrition (GHW)	Prerequisite: none	3 credits
NUTR 358 Assessment of Nutritional Status	Prerequisite: NUTR 251	2 credits
NUTR 360 Nutrition Education and Behavior Change Theory	Prerequisites: NUTR 251, Concurrent: NUTR 361	3 credits
NUTR 361 Community and Public Health Nutrition	Prerequisite: NUTR 251; Concurrent: NUTR 360	3 credits
NUTR 410 Eating and Weight Disorders	Prerequisite: NUTR 358	3 credits
NUTR 425 Global Nutrition		
NUTR 445 Nutrient Metabolism I	Prerequisite: NUTR 251, NUTR 358, BIOL 141, CHEM 101/110, CHEM 202, BMB 211	3 credits
NUTR 446 Nutrient Metabolism II	Prerequisite: NUTR 445	3 credits
NUTR 451 Nutrition throughout the Life Cycle	Prerequisite: NUTR 361, NUTR 358, concurrent: NUTR 446	3 credits
NUTR 452 Nutritional Aspects of Disease	Prerequisite: NUTR 445; Prerequisite or concurrent: NUTR 446	3 credits

FOOD SCIENCE

FDSC 105 (GHW) Food Facts and Fads	Prerequisite: none	3 credits
FDSC 200 Introductory Food Science	Prerequisite: CHEM 110	3 credits
FDSC 201 Introductory Food Science Practicum	Prerequisite or concurrent: FDSC 200	1 credit
MICRB 201 Introductory Microbiology	Prerequisite: CHEM 110	3 credits
MICRB 202 Introductory Microbiology Laboratory	Prerequisite: MICRB 201	2 credits
BMB 211 Elementary Biochemistry	Prerequisite: CHEM 202 or CHEM 210	3 credits
BMB 212 Elementary Biochemistry Laboratory	Prerequisite or concurrent: BMB 211	1 credit
FDSC 400 Food Chemistry	Prerequisite: CHEM 202; Prerequisite or concurrent: BMB 211, BMB 212, FDSC 200, FDSC 201	3 credits
FDSC 404 Sensory Evaluation of Foods	Prerequisite: STAT 250	3 credits
FDSC 405 Food Engineering Principles	Prerequisite: MATH 110, PHYS 250; Prerequisite or concurrent: FDSC 200, FDSC 201	3 credits
FDSC 406W Physiology of Nutrition	Prerequisite: BMB 211; Prerequisite or concurrent: FDSC 200, FDSC 201	3 credits
FDSC 408 Food Microbiology	Prerequisite: MICRB 201; Prerequisite or concurrent: FDSC 200, FDSC 201	3 credits
FDSC 409 Food Microbiology Laboratory	Prerequisite: MICRB 202; Prerequisite or concurrent: FDSC 200, FDSC 201, FDSC 408	2 credits
FDSC 410 Chemical Methods for Food	Prerequisite: BMB 212, FDSC 400;	3 credits

Analysis	Prerequisite or concurrent: FDSC 200, FDSC 201	
FDSC 413 Science and Technology of Plant Foods	Prerequisite: FDSC 200, FDSC 201; two of (FDSC 400, FDSC 405, FDSC 408, FDSC 410)	3 credits
FDSC 414 Science and Technology of Dairy Foods	Prerequisite: FDSC 200, FDSC 201; two of (FDSC 400, FDSC 405, FDSC 408, FDSC 410)	3 credits
FDSC 430 Unit Operations in Food Processing	Prerequisite: FDSC 405, FDSC 400, FDSC 408	3 credits
FDSC 497 Foodborne Pathogen Genomic Epidemiology	Prerequisite: MICRB 201 and MICRB 202 or FDSC 408 and FDSC 409	3 credits

ANIMAL SCIENCE (can satisfy part of Animal Science Minor requirements)

ANSC 100 Introduction to Animal Industries (GN)	Prerequisite: none	3 credits
ANSC 201 Animal Science	Prerequisite: none	4 credits
ANSC 211 Introduction to Avian Biology	Prerequisite: BIOL 110	3 credits
AN SC 213 Introduction to Animal Biotechnology	Prerequisite: CHEM 101, 130, or 110 and BIOL 110	3 credits
ANSI 301 Principles of Animal Nutrition	Prerequisite: CHEM 202 or CHEM 210	
ANSC 306 Swine Production and Management	Prerequisite: ANSC 201	3 credits
ANSC 309 Beef Cattle Production and Management	Prerequisite: ANSC 201	3 credits
ANSC 310 Dairy Cattle Production and Management	Prerequisite: ANSC 201	3 credits
ANSC 311 Poultry Production and Management	Prerequisite: ANSC 100	3 credits
ANSC 322 Animal Genetics and Selection	BIOL 110	3 credits
ANSC 350 Dairy Problem Solving	Prerequisite: ANSC 310	2 credits
ANSC 410 Advanced Dairy Herd Management	Prerequisite: ANSC 310	3 credits
ANSC 413 Transgenic Biology	Prerequisite: BMB 211 or BIOL 230W and ANSC 322 or BIOL 222	3 credits
ANSC 420 Animal Nutrition and Feed Technology	Prerequisite: ANSC 301	3 credits
ANSC 422 Dairy Cattle Evaluation and Selection	Prerequisite: ANSC 322, BIOL 222	3 credits
ANSC 424 Livestock Breeding Evaluation and Selection	Prerequisite: ANSC 324	3 credits
ANSC 450 Dairy Farm Management Systems	Prerequisite: ANSC 310, ANSC 350, ANSC 410	3 credits

INFORMATION AND CYBERSECURITY SCIENCES

IST 220 Network and Telecommunications	Prerequisite: none	3 credits
SRA 221 Overview of Information Security	Prerequisite: SRA 111	3 credits
IST 242 Intermediate & Object-Oriented Application Development	Prerequisite: IST 140 or CMPSC 121	3 credits
IST 261 Application Development Design Studio	Prerequisite: IST 242	3 credits
CYBER 262 Cyber-Defense Studio	Prerequisite: CYBER 100S, IST 140	3 credits
CYBER 362 Cybersecurity Analytics Studio	Prerequisite: CYBER 262 and IST 261 Co-requisite: SRA 365	3 credits
CYBER 366 Malware Analytics	Prerequisite: CYBER 262, IST 261, and IST 242	3 credits
IST 451 Network Security	Prerequisite: IST 220 and SRA 221	3 credits
IST 454 Computer and CYBER Forensics	Prerequisite: Either IST 220 or SRA 221	3 credits
IST 456 Information Security Management	Prerequisite: IST 220 and SRA 221	3 credits

ASTROPHYSICS

Most students in the Astrophysics specialization are expected to take courses with asterisk (*).

*ASTRO 1 Astronomical Universe (GN)	Prerequisite: none	3 credits
*ASTRO 120 The Big Bang Universe (GN) or ASTRO 130 Black Holes in the Universe (GN) or ASTRO 140 Life in the Universe	Prerequisite: ASTRO 1, 6, or 10 Prerequisite: ASTRO 1, 6, or 10 Prerequisite: ASTRO 1, 5, or 10	3 credits
*ASTRO 401 Fundamentals of Planetary Science and Astronomy	Prerequisite: MATH 140; ASTRO 1, 5, 6 or 10	4 credits
*ASTRO 402 Astronomical Telescopes, Techniques, and Data Analysis	Prerequisite: ASTRO 401	3 credits
*PHYS 211 General Physics: Mechanics (GN)	Concurrent Courses: MATH 140	4 credits
PHYS 212 General Physics: Electricity and Magnetism (GN)	Prerequisite: MATH 140, PHYS 211 Concurrent Courses: MATH 141	4 credits
ASTRO 291 Astronomical Methods and the Solar System	Prerequisite: PHYS 211	3 credits
ASTRO 292 Astronomy of the Distant Universe	Prerequisite: ASTRO 291	3 credits
ASTRO 410 Computational Astrophysics	Prerequisite: (CMPSC 201 or CMPSC 121) and PHYS 212 and PHYS 213 and PHYS 214	3 credits
ASTRO 420 Planets and Planetary System Formation	Prerequisite: ASTRO 292	3 credits
ASTRO 451 Astronomical Techniques	Prerequisite: PHYS 212 and PHYS 213 and PHYS 214	3 credits
ASTRO 475 Stars and Galaxies	Prerequisite: ASTRO 292	3 credits
ASTRO 496 Independent Studies	Prerequisite: none	1-3 credits

PSYCHOLOGY

PSYCH 100 Introductory Psychology (GS)	Prerequisite: none	3 credits
PSYCH 212 Introduction to Developmental Psychology (GS)	Prerequisite: PSYCH 100	3 credits
PSYCH 221 Introduction to Social Psychology (GS)	Prerequisite: PSYCH 100	3 credits
PSYCH 243 Introduction to Well-being and Positive Psychology	Prerequisite: PSYCH 100	3 credits
PSYCH 253 Introduction to Psychology of Perception (GS)	Prerequisite: PSYCH 100	3 credits
PSYCH 256 Introduction to Cognitive Psychology (GS)	Prerequisite: PSYCH 100	3 credits
PSYCH 260/BBH 203 Neurological Bases of Human Behavior	Prerequisite: none	3 credits
PSYCH 261 Introduction to Psychology of Learning (GS)	Prerequisite: PSYCH 100	3 credits
PSYCH 270 Introduction to Abnormal Psychology	Prerequisite: PSYCH 100	3 credits
PSYCH 301W Basic Research Methods in Psychology	Prerequisite: PSYCH 100 and PSYCH 200 or STAT 200	3 credits
PSYCH 412 Adolescence	Prerequisite: PSYCH 100	3 credits
PSYCH 413 Cognitive Development	Prerequisite: PSYCH 100, PSYCH 212	3 credits
HDFS 455/PSYCH 416 Development Throughout Adulthood	Prerequisite: PSYCH 100, PSYCH 301, STAT 200	3 credits
PSYCH 419 Psychology and a Sustainable World	Prerequisite: PSYCH 100, PSYCH 221	3 credits
PSYCH 423 Social Psychology of Interpersonal/Intergroup Relationships	Prerequisite: PSYCH 100, PSYCH 221	3 credits
PSYCH 425 Psychology of Human Emotion	Prerequisite: PSYCH 100, 6 additional credits of PSYCH	3 credits
PSYCH 441 Health Psychology	Prerequisite: PSYCH 100, 6 additional credits of PSYCH	3 credits
PSYCH 452 Learning and Memory	Prerequisite: PSYCH 100, PSYCH 256	3 credits
PSYCH 456 Advanced Cognitive Psychology	Prerequisite: PSYCH 100, 6 additional credits of PSYCH	3 credits
PSYCH 458 Visual Cognition	Prerequisite: PSYCH 100, 6 additional credits of PSYCH	3 credits

ENGINEERING SCIENCE AND MECHANICS (Nanotechnology)

ESC 312 Engineering Applications of Wave, Particle, and Ensemble Concepts	Prerequisite: PHYS 214	3 credits
ESC 313 Introduction to Principles, Fabrication Methods, and Applications of Nanotechnology	Prerequisite: CHEM 110, CHEM 111, PHYS 212, PHYS 214	3 credits
ESC 419 Electronic Properties and Applications of Materials	Prerequisite: ESC 312	3 credits
ESC 481 Elements of Nano/Micro-electromechanical System Processing and Design	Prerequisite: ESC 312	3 credits
ESC 483 Simulation and Design of Nanostructures	Prerequisite: ESC 312, MATH 230	3 credits
ESC 484 Biologically Inspired Nanomaterials	Prerequisite: PHYS 214, MATH 230	3 credits

MARKETING

BA 303 Marketing	Prerequisite: ECON 102 (GS)	3 credits
MKTG 330 Consumer Behavior	Prerequisite: BA 303 or MKTG 301	3 credits
MKTG 342 Marketing Research	Prerequisite: BA 303 or MKTG 301; SCM 200 or STAT 200	3 credits
MKTG 450W Marketing Strategy	Prerequisite: MKTG 330, MKTG 342	3 credits
MKTG 327 Retailing	Prerequisite: BA 303 or MKTG 301	3 credits
MKTG 422 Advertising and Sales Promotion Management	Prerequisite: MKTG 330 or MKTG 342	3 credits
MKTG 437 Advanced Retailing and Merchandise Management	Prerequisite: MKTG 330, MKTG 342	3 credits
MKTG 445 Global Marketing	Prerequisite: BA 303 or MKTG 301	3 credits
MKTG 472 Strategic Brand Management	Prerequisite: MKTG 330, MKTG 342	3 credits
MKTG 473 Digital Marketing	Prerequisite: MKTG 330, MKTG 342	3 credits
MKTG 426 Business Marketing	Prerequisite: MKTG 330, MKTG 342	3 credits
MKTG 474 Marketing Analytics	Prerequisite: MKTG 330, MKTG 342	3 credits