





**1. Purpose and Nature of Program**

Provide a brief program description. Include the distinctive features of the program that make it unique.

The purpose of the degree is to integrate and cohere particular STEM-like skills increasingly in demand in the 21st century within a new interdisciplinary major; skills that increasingly differ from those needed to succeed in the last century for a great many graduates in traditionally non-STEM degrees. Degree will be stand alone and available at the Polytechnic campus and available as a concurrent degree on other campuses.

**2. Student Learning Outcomes and Assessment Methods**

**A. Knowledge, competencies, and skills**

List the knowledge, competencies, and skills students should have when they graduate from the proposed degree program. You can find examples of program Learning Outcomes at (<https://uoeee.asu.edu/plan-outcomes>).

Students who complete the degree will acquire the following six "habits of mind" related to 21st century skills. A habit of mind is a mental activity that becomes increasingly automatic over the curriculum and extends to career development.

- Information skills involving effective search and evaluation
- Sophisticated insight involving statistical inference and quantitative reasoning
- Creative and informed experimentation in search of new insights
- Apply/project quantitative reasoning to unfamiliar contexts
- Critical and adaptable thinking for complex problems
- Communication within and without the expert domain

**B. Assessment**

Describe the plan and methods to assess whether students have achieved the knowledge, competencies and skills identified in the Learning Outcomes. You can find examples of assessment methods at (<https://uoeee.asu.edu/creating-plan>).

Students will engage in a capstone experience in which they will be expected to demonstrate knowledge, competencies, and skills. The capstone experience involves research and/or a project that explicitly synthesizes the six habits of mind. The capstone experience could take many forms - e.g., internship, directed study, thesis, research credit, capstone course or applied project. For concurrent students, the capstone experience could be a course in the student's other degree.

**3. Academic Curriculum and Requirements**

**A. Major Map.**

Attach a copy of the “proposed” major map for this degree program and each concentration(s) to be offered. Instructions on how to create a “proposed major map” in [BAMM](#) can be found in the [Build a Major Map Training Guide](#).

**B. Summary of credit hours required for this program**

Total credit hours must be 120 and include first year composition, general studies, core/required courses, program specific electives, and any additional requirements (e.g., concentration credits).

<b>Requirements</b>	<b>Credit Hours</b>
<b>First Year Composition</b>	<b>6</b>
<b>ASU 101 (or Equivalent)</b>	1
<b>General Studies</b>	44
<b>Core/required courses</b>	15
<b>Program specific electives</b>	21
<b>Additional requirements (University Electives)</b>	33
<b>Other; please explain</b>	0
<b>Total</b>	<b>120</b>

**C. Core/Required Courses.****i. Total required and/or core course credit hours:**

Students completing the stand-alone version of the program will complete 36 core hours for the degree, including 15 credit hours of required core courses distributed across four categories:

- (1) Statistics [6 hours; only 3 hours may be lower-division]
- (2) Data Skills [3 hours]
- (3) Technical/Professional Communication [3 hours]
- (4) Capstone/Project [3 hours]

\*Students on the Polytechnic campus may choose either the concurrent or stand-alone version of the degree.

Overall (core and electives), students in the concurrent version will complete 24 core hours for the degree.

In the concurrent version of the degree, which will be available on all four campuses, students will complete 15 credit hours of required core courses distributed across the four categories:

- (1) Statistics [6 hours; only 3 hours may be lower-division]
- (2) Data Skills [3 hours]
- (3) Technical/Professional Communication [3 hours]
- (4) Capstone/Project [3 hours]

**ii. List the name, prefix, and credit hours for each required/core course for this program**

Students will complete 15 credit hours of required courses distributed across four categories:

**(1) Statistics [6 hours];** only 3 hours may be lower-division

Students choose from the following list, which is illustrative, not exhaustive.

- ABS 350 Applied Statistics, CS (3)
- ACT 201 Introduction to Elements and Techniques of Actuarial Science (3)
- ACT 415 Probability for Risk Management (3)
- ACT 430 Mathematics of Financial Derivatives (3)
- ACT 435 Actuarial Business Forecasting (3)
- AGB 360 Agribusiness Statistics, CS (3)
- AGB 481 Strategic Pricing in Food Markets (3)
- AML 441 Mathematical Concepts and Tools in Sustainability (3)
- ASM 465 Quantification and Analysis for Anthropologists, CS (3)
- BIO 355 Introduction to Computational Molecular Biology, CS (3)
- BIO 406 Computer Applications in Biology (3)
- BIO 415 Biometry, CS (4)
- BIO 424 Dynamic Modeling in Social and Ecological Systems (4)
- BUS 434 Risk Management and Insurance (3)
- CHM 240 Mathematical Methods in Chemistry, CS (3)
- CIS 309 Business Process Management (3)
- CIS 405 Business Intelligence (3)
- CRJ 303 Statistical Analysis, CS (3)
- ECN 221 Business Statistics, CS (3)
- ECN 231 Honors Business Statistics, CS (3)
- ECN 410 Applied Regression Analysis and Forecasting (3)
- ECN 416 Game Theory and Economic Behavior (3)
- ECN 425 Introduction to Econometrics (3)
- ECN 470 Mathematical Economics (3)
- EGR 280 Engineering Statistics, CS (3)
- FIN 421 Security Analysis and Portfolio Management (3)
- GIS 220 Mathematical Principles in GIS (3)

GIS 431 Spatial Databases (3)  
GIS 461 Optimization Fundamentals for Spatial Analysis (3)  
GIS 462 Location Analysis and Modeling (3)  
GIS 470 Statistics for Geographers, CS (3)  
GIS 471 Geographic Information Analysis (3)  
GIS 472 Spatial Regression Analysis (3)  
HCD 300 Biostatistics, CS (3)  
IEE 380 Probability and Statistics for Engineering Problem Solving, CS (3)  
JUS 302 Statistical Analysis for Justice Studies, CS (3)  
MAT 351 Mathematical Methods for Genetic Analysis, CS (3)  
MAT 355 Introduction to Computational Molecular Biology, CS (3)  
MAT 451 Mathematical Modeling, CS (3)  
MBB 355 Introduction to Computational Molecular Biology, CS (3)  
PAF 301 Applied Statistics, CS (3)  
PBH 300 Biostatistics, CS (3)  
PHY 201 Mathematical Methods in Physics I, CS (3)  
PHY 302 Mathematical Methods in Physics II (3)  
POS 401 Political Statistics, CS (3)  
PSY 230 Introduction to Statistics, CS (3)  
PSY 231 Honors Introduction to Statistics, CS (4)  
PSY 330 Statistical Methods, CS (3)  
PUP 481 Optimization Fundamentals for Spatial Analysis (3)  
PUP 482 Location Analysis and Modeling (3)  
SBS 304 Social Statistics I, CS (3)  
SCM 315 Business Decision Models (3)  
SCM 440 Quality Management/Measurement (3)  
SOC 390 Social Statistics I, CS (3)  
SOS 101 Introduction to Applied Mathematics for the Life and Social Sciences, MA (3)  
STP 220 Conceptual Statistics (3)  
STP 226 Elements of Statistics, CS (3)  
STP 231 Statistics for the Life Sciences, CS (3)  
STP 310 Design and Analysis of Experiments (3)  
STP 311 Regression and Time Series Analyses (3)  
STP 326 Intermediate Probability, CS (3)  
STP 420 Introductory Applied Statistics (3)  
STP 421 Probability (3)  
STP 425 Stochastic Processes (3)  
STP 427 Mathematical Statistics (3)  
STP 429 Experimental Statistics, CS (3)  
STP 450 Nonparametric Statistics (3)  
STP 452 Multivariate Statistics (3)  
STP 460 Categorical Data Analysis (3)  
STS 401 Statistics in Science Technology and Society, CS (3)  
SWU 321 Statistics for Social Workers, CS (3)

**(2) Data Skills [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive.

ACO 100 All About Data: Design, Query and Visualization, CS (3)  
ACO 220 Introduction to Database Systems, CS (3)  
AFR 490 Field Studies in the Diaspora (3)  
AIS 420 American Indian Studies Research Methods, L (3)  
AML 253 Introduction to Mathematical Tools and Modeling for the Life and Social Sciences (3)  
AML 330 Social Simulation, CS (4)  
ARE 496 Methods and Assessment of Learning in Art (3)  
ARS 480 Research Methods, L (3)  
ART 435 Foundry Research Methods (1-4)  
ASB 230 Beginning Social Research (3)  
ASB 302 Ethnographic Field Study, (L or SB) & C (3)  
ASB 430 Social Simulation, CS (4)



ASB 443 Cross-Cultural Studies in Global Health, (L or SB) & G (3-6)  
ASM 338 Anthropological Field Session (1-12)  
ASM 365 Doing Archaeology (3-4)  
ASM 424 Dynamic Modeling in Social and Ecological Systems (4) (students may use a range of prefixes)  
BCH 392 Introduction to Research Techniques (1-3)  
BCH 467 Analytical Biochemistry Laboratory, L (3)  
BIO 314 Research Colloquium in Biology and Society I, L (2)  
BIO 406 Computer Applications in Biology (3)  
BIO 410 Techniques in Conservation Biology and Ecology, L (3)  
BIO 411 Quantitative Methods in Conservation and Ecology (4)  
BIO 417 Experimental Design (3)  
BIO 435 Research Techniques in Animal Behavior (3)  
BIO 456 Bioinformatics and Molecular Evolution (3)  
BIO 469 Computational Neuroscience: Case Studies in Neuroethology (4)  
BIO 489 School of Life Sciences Undergraduate Research Fellow (1)  
BIS 499 Individualized Instruction (1-3)  
BUS 384 Small Business Operations and Planning (3)  
CHM 325 Analytical Chemistry (3)  
CHM 326 Advanced Analytical Chemistry Laboratory (1)  
CHM 327 Instrumental Analysis (3)  
CHM 328 Instrumental Analysis Laboratory (2)  
CHM 392 Introduction to Research Techniques (1-3)  
CIS 105 Computer Applications and Information Technology, CS (3)  
CIS 235 Introduction to Information Systems (3)  
CIS 308 Advanced Excel in Business (3)  
CIS 315 Introduction to Business Data Analytics (3)g  
CIS 340 Business Information System Development I (3)  
CIS 345 Business Information System Development II (3)  
CIS 355 Business Data Warehouses and Dimensional Modeling (3)  
CIS 360 Business Database Concepts (3)  
CIS 365 Business Database Systems Development (3)  
CIS 375 Business Data Mining (3)  
CIS 415 Big Data Analytics and Visualization in Business (3)  
CIS 430 Networks and Distributed Systems (3)  
CIS 440 Systems Design and Electronic Commerce, L (3)  
CIS 450 Enterprise Analytics (3)  
COM 308 Advanced Research Methods in Communication, L (3)  
COM 407 Advanced Critical Methods in Communication (3)  
COM 408 Quantitative Research Methods in Communication (3)  
CPI 101 Introduction to Informatics, CS (3)  
CSE 100 Principles of Programming with C++, CS (3)  
CSE 110 Principles of Programming, CS (3)  
CSM 402 Assessment and Evaluation of Community Services (3)  
ECS 316 Assessment/Evidence-based Practice (3)  
EDS 302 Design Inquiry and Undergraduate Research (3)  
ENG 390 Methods of Inquiry (3)  
FAS 361 Research Methods, L or SB (3)  
FAS 390 Supervised Research Experience (1-3)  
FMS 300 Television and Cultural Studies, L or HU (3)  
GCU 351 Population Geography, L (3)  
GCU 442 Geographical Analysis of Transportation, SB (3)  
GCU 485 International Field Studies, G (1-12)  
GCU 496 Geographic Research Methods, L (3)  
GIS 201 Spatial Thinking (3)  
GIS 211 Geographic Information Science I, CS (4)  
GIS 311 Geographic Information Science II, CS (3)  
GIS 321 Programming Principles in GIS (3)  
GIS 322 Spatial Data Structures and Algorithms (3)  
GIS 341 Introduction to Cartography and Georepresentation, CS (3)

GIS 351 Air Photo Interpretation (3)  
GLG 362 Geomorphology (3)  
GLG 410 Computers in Geology, CS (3)  
GLG 451 Field Geology I, L (3)  
GLG 452 Field Geology II, L (3)  
GLG 455 Advanced Field Geology (3-4)  
GLG 489 Field Geochemistry (3 credit hours)  
GPH 409 Synoptic Meteorology I (4)  
GPH 410 Synoptic Meteorology II (4)  
GPH 491 Geographic Field Methods (3)  
HCR 301 Research Methods for the Health Care Professional (3)  
HCR 400 Evidence-Based Practice for the Health Care Professional (3)  
HST 300 Historical Inquiry (L or HU or SB) & H (3)  
HST 495 Methods of Historical Inquiry, L (3)  
JUS 301 Research in Justice Studies, SB (3)  
PAF 302 Public Service Research Methods (3)  
PHI 333 Symbolic Logic (3)  
PHI 413 Advanced Symbolic Logic (3)  
PHY 111 General Physics, SQ (3)  
PHY 112 General Physics, SQ (3)  
PHY 113 General Physics Laboratory, SQ (1)  
PHY 114 General Physics Laboratory, SQ (1)  
PHY 334 Advanced Laboratory I, L (3)  
PHY 465 Advanced Laboratory II (3)  
PHY 472 Advanced Biophysics Lab (3)  
PLB 432 Computer Applications in Biology (3)  
POS 301 Empirical Political Inquiry, SB (3)  
PSY 244 Introduction to Directed Child Study (3)  
PSY 290 Research Methods, L or SG (4)  
PSY 304 Effective Thinking, L (3)  
PSY 390 Experimental Psychology, L (3)  
PSY 471 Psychological Testing (3)  
PUP 361 Planning Workshop I (4)  
PUP 424 Planning Methods (4)  
PUP 462 Planning Workshop II (4)  
SCM 314 Analytics for Logistics (3)  
SCM 344 Applied Logistics Management (3)  
SCM 345 Logistics Management (3)  
SCM 432 Planning and Control Systems for Supply Chain Management (3)  
SCN 307 Learning from Nature: Biomimicry and STEM (3)  
SES 100 Introduction to Exploration, CS (3)  
SES 330 Practical Electronics and Instrumentation (4)  
SES 350 Engineering Systems and Experimental Problem Solving (3)  
SES 405 Exploration Systems Engineering (3)  
SGS 305 Research Methods, L (3)  
SOC 333 Population, SB & G (3)  
SOC 391 Research Methods, L or SB (3)  
SOC 433 Applied Demography, SB (3)  
SPA 422 Spanish Lexicology and Lexicography (3)  
STP 310 Design and Analysis of Experiments (3)  
STS 301 Research in Science and Technology Studies (3)  
STS 304 Science, Technology, and Society, SB (3)  
TEL 430 Learning Outside of School (3)  
TEL 431 Learning in Workplaces (3)

**(3) Technical/Professional Communication [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive.

AME 112 Computational Thinking for Digital Culture (3)  
AME 194 Form, Aesthetics and Composition for Media Arts (1-4)  
AML 330 Social Simulation, CS (4)

ART 116 Introduction to Digital Media (3)  
BIO 315 Science, Values, and the Public (3)  
COM 250 Introduction to Organizational Communication, SB (3)  
COM 259 Communication in Business and the Professions (3)  
COM 459 Theory and Methods of Social Media Networks (3)  
CPI 111 Game Development I, CS (3)  
EDS 200 Design Literacy and Communication (3)  
ENG 301 Writing for the Professions, L (3)  
ENG 370 Science, Values, and the Public (3)  
ENG 483 Methods of Teach Secondary Literature and Language (3)  
ENG 485 Digital Tools (3)  
FMP 255 Media Authorship, CS (3)  
FMS 351 Emerging Digital Media (3)  
GIT 135 Graphic Communications (3)  
GIT 210 Creative Thinking and Design Visualization (3)  
GIT 303 Digital Publishing (3)  
GIT 312 3-D Computer Graphics Modeling and Representation, CS (3)  
GLG 410 Computers in Geology, CS (3)  
GRA 345 Design Rhetoric, L (3)  
HCR 406 Health Literacy for Health Care Professionals (3)  
IAP 361 Digital Editing and Media Literacy, CS (3)  
IND 228 Imaging and Visualization (3)  
MHL 201 Media Literacy for Musicians, CS (3)  
MTE 250 Technology and Mathematical Visualization (3)  
TWC 301 Fundamentals of Writing for Digital Media, L (3)  
TWC 347 Written Communication for Managers, L (3)  
TWC 411 Principles of Visual Communication, L (3)  
TWC 414 Visualizing Data and Information (3)  
UNI 110 Critical Reading and Thinking (3)

**(4) Capstone/Project [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive.

AML 406 Directed Reading & Research in Applied Mathematics for the Life & Social Sciences (3)  
ARS 498 Pro-Seminar (1-7) (Students may use a range of prefixes.)  
ASB 452 Community Partnerships for Global Health, SB (3-9)  
ASM 414 Urban and Environmental Health, SB (3)  
BIO 310 Special Problems & Techniques (1-3)  
BIO 389 School of Life Sciences Undergraduate Researcher (1)  
BIS 484 Internship (1-12) (Students may use a range of prefixes.)  
CSS 499 Individualized Instruction (1-3 credit hours) (Students may use a range of prefixes).  
FAS 390 Supervised Research Experience (1-3)  
FAS 460 Leadership, Research, and Collaboration in Community Change (3) (Students may use a range of prefixes)  
FAS 461 Community Action Research Experience Research Internship (3) (Students may use a range of prefixes)  
FIN 461 Financial Cases and Modeling, L (3)  
FIN 494 Special Topics (1-4)  
GIS 472 Spatial Regression Analysis (3)  
GIT 480 Senior Project (3)  
GLG 464 Solving Environmental Problems (3)  
GLG 495 Undergraduate Thesis (3)  
HON 492 Honors Directed Study (1-6) (Students may use a range of prefixes.)  
HON 493 Honor Thesis, L (1-6) (Students may use a range of prefixes)  
HRC 480 Capstone: Practices and Approaches (3)  
MBB 490 Capstone: Issues in Biotechnology, L (2)  
MBB 491 Capstone: Issues in Molecular Biosciences, L (2)  
PSY 399 Supervised Research (1-3)  
PSY 477 Applied Capstone Experience (3)  
SES 410 Senior Exploration Project I (3)  
SES 411 Senior Exploration Project II (3)



SSH 402 Community Partnerships for Global Health, SB (3-9)  
SSH 405 Senior Seminar in Global Health (3)  
SSH 414 Urban and Environmental Health, SB (3)  
TCL 305 Transborder Practicum and Field Research (3) USL 496 Service Learning Capstone (3)

**D. Program Specific Electives.**

i. Total required program elective credit hours:

Students in the stand-alone version of the degree will complete 21 elective hours.

Students in the concurrent version of the degree, which will be available on all four campuses, will complete 9 elective credit hours.

\*Students on the Polytechnic campus may choose either version of the degree.

ii. List the name, prefix, and credit hours for any program specific electives for this program:

Students will complete 9 (for concurrent version) or 21 (for stand-alone version) credit hours of elective courses distributed across four categories:

(1) **Statistics [6 hours]**; only 3 hours may be lower-division

Students choose from the following list, which is illustrative, not exhaustive.

ABS 350 Applied Statistics, CS (3)

ACT 201 Introduction to Elements and Techniques of Actuarial Science (3)

ACT 415 Probability for Risk Management (3)

ACT 430 Mathematics of Financial Derivatives (3) ACT 435

Actuarial Business Forecasting (3)

AGB 360 Agribusiness Statistics, CS (3)

AGB 481 Strategic Pricing in Food Markets (3)

AML 441 Mathematical Concepts and Tools in Sustainability (3)

ASM 424 Dynamic Modeling in Social and Ecological Systems (4) (students may use a range of prefixes)

ASM 465 Quantification and Analysis for Anthropologists, CS (3)

BIO 406 Computer Applications in Biology (3)

BIO 415 Biometry, CS (4)

BIO 424 Dynamic Modeling in Social and Ecological Systems (4)

BUS 434 Risk Management and Insurance (3)

CHM 240 Mathematical Methods in Chemistry, CS (3)

CIS 309 Business Process Management (3)

CIS 405 Business Intelligence (3)

CRJ 303 Statistical Analysis, CS (3)

ECN 221 Business Statistics, CS (3)

ECN 231 Honors Business Statistics, CS (3)

ECN 410 Applied Regression Analysis and Forecasting (3)

ECN 416 Game Theory and Economic Behavior (3)

ECN 425 Introduction to Econometrics (3)

ECN 470 Mathematical Economics (3)

EGR 280 Engineering Statistics, CS (3)

FIN 421 Security Analysis and Portfolio Management (3)

GIS 220 Mathematical Principles in GIS (3)

GIS 431 Spatial Databases (3)

GIS 461 Optimization Fundamentals for Spatial Analysis (3)

GIS 462 Location Analysis and Modeling (3)  
GIS 470 Statistics for Geographers, CS (3)  
GIS 472 Spatial Regression Analysis (3)  
HCD 300 Biostatistics, CS (3)  
IEE 380 Probability and Statistics for Engineering Problem Solving, CS (3)  
JUS 302 Statistical Analysis for Justice Studies, CS (3)  
MAT 351 Mathematical Methods for Genetic Analysis, CS (3)  
MAT 355 Introduction to Computational Molecular Biology, CS (3)  
MAT 451 Mathematical Modeling, CS (3)  
MBB 355 Introduction to Computational Molecular Biology, CS (3)  
PAF 301 Applied Statistics, CS (3)  
PBH 300 Biostatistics, CS (3)  
PHY 201 Mathematical Methods in Physics I, CS (3)  
PHY 302 Mathematical Methods in Physics II (3)  
POS 401 Political Statistics, CS (3)  
PSY 230 Introduction to Statistics, CS (3)  
PSY 231 Honors Introduction to Statistics, CS (4)  
PSY 330 Statistical Methods, CS (3)  
PUP 481 Optimization Fundamentals for Spatial Analysis (3)  
PUP 482 Location Analysis and Modeling (3)  
SBS 304 Social Statistics I, CS (3)  
SCM 315 Business Decision Models (3)  
SCM 440 Quality Management/Measurement (3)  
SOC 390 Social Statistics I, CS (3)  
SOS 101 Introduction to Applied Mathematics for the Life and Social Sciences, MA (3)  
STP 220 Conceptual Statistics (3)  
STP 226 Elements of Statistics, CS (3)  
STP 231 Statistics for the Life Sciences, CS (3)  
STP 310 Design and Analysis of Experiments (3)  
STP 311 Regression and Time Series Analyses (3)  
STP 326 Intermediate Probability, CS (3)  
STP 420 Introductory Applied Statistics (3)  
STP 421 Probability (3)  
STP 425 Stochastic Processes (3)  
STP 427 Mathematical Statistics (3)  
STP 429 Experimental Statistics, CS (3)  
STP 450 Nonparametric Statistics (3)  
STP 452 Multivariate Statistics (3)  
STP 460 Categorical Data Analysis (3)  
STS 401 Statistics in Science Technology and Society, CS (3)  
SWU 321 Statistics for Social Workers, CS (3)

**(2) Data Skills [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive. ACO

100 All About Data: Design, Query and Visualization, CS (3)  
ACO 220 Introduction to Database Systems, CS (3)  
AFR 490 Field Studies in the Diaspora (3)  
AIS 420 American Indian Studies Research Methods, L (3)  
AML 253 Introduction to Mathematical Tools and Modeling for the Life and Social Sciences (3)  
AML 330 Social Simulation, CS (4)  
ARE 496 Methods and Assessment of Learning in Art (3) ARS 480 Research  
Methods, L (3)  
ART 435 Foundry Research Methods (1-4)  
ASB 230 Beginning Social Research (3)  
ASB 302 Ethnographic Field Study, (L or SB) & C (3)  
ASB 430 Social Simulation, CS (4)  
ASB 443 Cross-Cultural Studies in Global Health, (L or SB) & G (3-6)  
ASM 338 Anthropological Field Session (1-12)  
ASM 365 Doing Archaeology (3-4)

BCH 392 Introduction to Research Techniques (1-3)  
BCH 467 Analytical Biochemistry Laboratory, L (3)  
BIO 314 Research Colloquium in Biology and Society I, L (2)  
BIO 355 Introduction to Computational Molecular Biology, CS (3)  
BIO 406 Computer Applications in Biology (3)  
BIO 410 Techniques in Conservation Biology and Ecology, L (3)  
BIO 411 Quantitative Methods in Conservation and Ecology (4)  
BIO 417 Experimental Design (3)  
BIO 435 Research Techniques in Animal Behavior (3)  
BIO 456 Bioinformatics and Molecular Evolution (3)  
BIO 469 Computational Neuroscience: Case Studies in Neuroethology (4)  
BIO 489 School of Life Sciences Undergraduate Research Fellow (1)  
BIS 499 Individualized Instruction (1-3)  
BUS 384 Small Business Operations and Planning (3)  
CHM 325 Analytical Chemistry (3)  
CHM 326 Advanced Analytical Chemistry Laboratory (1)  
CHM 327 Instrumental Analysis (3)  
CHM 328 Instrumental Analysis Laboratory (2)  
CHM 392 Introduction to Research Techniques (1-3)  
CIS 105 Computer Applications and Information Technology, CS (3)  
CIS 235 Introduction to Information Systems (3)  
CIS 308 Advanced Excel in Business (3)  
CIS 315 Introduction to Business Data Analytics (3)  
CIS 340 Business Information System Development I (3)  
CIS 345 Business Information System Development II (3)  
CIS 355 Business Data Warehouses and Dimensional Modeling (3)  
CIS 360 Business Database Concepts (3)  
CIS 365 Business Database Systems Development (3)  
CIS 375 Business Data Mining (3)  
CIS 415 Big Data Analytics and Visualization in Business (3)  
CIS 430 Networks and Distributed Systems (3)  
CIS 440 Systems Design and Electronic Commerce, L (3)  
CIS 450 Enterprise Analytics (3)  
COM 308 Advanced Research Methods in Communication, L (3)  
COM 407 Advanced Critical Methods in Communication (3)  
COM 408 Quantitative Research Methods in Communication (3)  
CPI 101 Introduction to Informatics, CS (3)  
CSE 100 Principles of Programming with C++, CS (3)  
CSE 110 Principles of Programming, CS (3)  
CSM 402 Assessment and Evaluation of Community Services (3)  
ECS 316 Assessment/Evidence-based Practice (3)  
EDS 302 Design Inquiry and Undergraduate Research (3)  
ENG 390 Methods of Inquiry (3)  
FAS 361 Research Methods, L or SB (3)  
FAS 390 Supervised Research Experience (1-3)  
FMS 300 Television and Cultural Studies, L or HU (3)  
GCU 351 Population Geography, SB & G (3)  
GCU 442 Geographical Analysis of Transportation, SB (3)  
GCU 485 International Field Studies, G (1-12)  
GCU 496 Geographic Research Methods, L (3)  
GIS 201 Spatial Thinking (3)  
GIS 211 Geographic Information Science I, CS (4)  
GIS 311 Geographic Information Science II, CS (4)  
GIS 321 Programming Principles in GIS (3)  
GIS 322 Spatial Data Structures and Algorithms (3)  
GIS 341 Introduction to Cartography and Georepresentation, CS (3)  
GIS 351 Air Photo Interpretation (3)  
GLG 362 Geomorphology (3)  
GLG 410 Computers in Geology, CS (3)  
GLG 451 Field Geology I, L (3)

GLG 452 Field Geology II, L (3)  
GLG 455 Advanced Field Geology (3-4)  
GLG 489 Field Geochemistry, L (3)  
GPH 409 Synoptic Meteorology I (4)  
GPH 410 Synoptic Meteorology II (4)  
GPH 491 Geographic Field Methods (3)  
HCR 301 Research Methods for the Health Care Professional (3)  
HCR 400 Evidence-Based Practice for the Health Care Professional (3)  
HST 300 Historical Inquiry, (L or HU or SB) & H (3)  
HST 495 Methods of Historical Inquiry, L (3)  
JUS 301 Research in Justice Studies, SB (3)  
PAF 302 Public Service Research Methods (3)  
PHI 333 Symbolic Logic (3)  
PHI 413 Advanced Symbolic Logic (3)  
PHY 111 General Physics, SQ (3)  
PHY 112 General Physics, SQ (3)  
PHY 113 General Physics Laboratory (1)  
PHY 114 General Physics Laboratory, SQ (1)  
PHY 334 Advanced Laboratory I, L (3)  
PHY 465 Advanced Laboratory II (3)  
PHY 472 Advanced Biophysics Lab (3)  
PLB 432 Computer Applications in Biology (3)  
POS 301 Empirical Political Inquiry, SB (3)  
PSY 244 Introduction to Directed Child Study (3)  
PSY 290 Research Methods, L or SG (4)  
PSY 304 Effective Thinking, L (3)  
PSY 390 Experimental Psychology, L (3)  
PSY 399 Supervised Research (1-3)  
PSY 471 Psychological Testing (3)  
PUP 361 Planning Workshop I (4)  
PUP 424 Planning Methods (4)  
PUP 462 Planning Workshop II (4)  
SCM 314 Analytics for Logistics (3)  
SCM 344 Applied Logistics Management (3)  
SCM 345 Logistics Management (3)  
SCM 432 Planning and Control Systems for Supply Chain Management (3)  
SCN 307 Learning from Nature: Biomimicry and STEM (3)  
SES 100 Introduction to Exploration, CS (3)  
SES 330 Practical Electronics and Instrumentation (4)  
SES 350 Engineering Systems and Experimental Problem Solving (3)  
SES 405 Exploration Systems Engineering (3)  
SGS 305 Research Methods, L (3)  
SOC 333 Population, SB & G (3)  
SOC 391 Research Methods, L or SB (3)  
SOC 433 Applied Demography, SB (3)  
SOC 451 Comparative Sociology, SB & G (3)  
SPA 422 Spanish Lexicology and Lexicography (3)  
STP 310 Design and Analysis of Experiments (3)  
STS 301 Research in Science and Technology and Society (3 )  
STS 304 Science, Technology Studies (3)  
TCL 304 Transborder Research Methods, SB & C (3)  
TEL 430 Learning Outside of School (3)  
TEL 431 Learning in Workplaces (3)

**(3) Technical/Professional Communication [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive. AME

112 Computational Thinking for Digital Culture (3)  
AME 194 Form, Aesthetics and Composition for Media Arts (1-4)  
AML 330 Social Simulation, CS (4)  
ART 116 Introduction to Digital Media (3)

BIO 315 Science, Values, and the Public (3)  
COM 250 Introduction to Organizational Communication, SB (3)  
COM 259 Communication in Business and the Professions (3)  
COM 459 Theory and Methods of Social Media Networks (3)  
CPI 111 Game Development I, CS (3)  
EDS 200 Design Literacy and Communication (3)  
ENG 301 Writing for the Professions, L (3)  
ENG 370 Science, Values, and the Public (3)  
ENG 485 Digital Tools (3)  
FMP 255 Media Authorship, CS (3)  
FMS 351 Emerging Digital Media (3)  
GIT 135 Graphic Communications (3)  
GIT 210 Creative Thinking and Design Visualization (3)  
GIT 303 Digital Publishing (3)  
GIT 312 3-D Computer Graphics Modeling and Representation, CS (3)  
GLG 410 Computers in Geology, CS (3)  
GRA 345 Design Rhetoric, L (3)  
HCR 406 Health Literacy for Health Care Professionals (3)  
IAP 361 Digital Editing and Media Literacy, CS (3)  
IND 228 Imaging and Visualization (3)  
MHL 201 Media Literacy for Musicians, CS (3)  
MTE 250 Technology and Mathematical Visualization (3)  
TWC 301 Fundamentals of Writing for Digital Media, L (3)  
TWC 347 Written Communication for Managers, L (3)  
TWC 411 Principles of Visual Communication, L (3)  
TWC 414 Visualizing Data and Information (3)  
UNI 110 Critical Reading and Thinking (3)

**(4) Capstone/Project [3 hours]**

Students choose from the following list, which is illustrative, not exhaustive.

AML 406 Directed Reading & Research in Applied Mathematics for the Life & Social Sciences (3)  
ARS 498 Pro-seminar (1-7) (Students may use a range of prefixes.)  
ASB 452 Community Partnerships for Global Health, SB (3-9)  
ASM 414 Urban and Environmental Health, SB (3)  
BIO 310 Special Problems & Techniques (1-3)  
BIO 389 School of Life Sciences Researcher (1)  
BIS 484 Internship (1-12) (Students may use a range of prefixes.)  
CSS 499 Individualized Instruction (1-3 credit hours) (Students may use a range of prefixes). ENG  
494 Special Topics (3) (Students may use a range of prefixes.)  
FAS 390 Supervised Research Experience (1-3)  
FAS 460 Leadership, Research, and Collaboration in Community Change (3) (students may use a range of prefixes)  
FAS 461 Community Action Research Experience Research Internship (3) (students may use a range of prefixes)  
FIN 461 Financial Cases and Modeling, L (3)  
FIN 494 Special Topics (1-4)  
GIS 472 Spatial Regression Analysis (3)  
GIT 480 Senior Project (3)  
GLG 464 Solving Environmental Problems (3)  
GLG 495 Undergraduate Thesis (3)  
HON 492 Honors Directed Study (1-6) (Students may use a range of prefixes.)  
HON 493 Honor Thesis, L (1-6)  
HRC 480 Capstone: Practices and Approaches (3)  
MBB 490 Capstone: Issues in Biotechnology, L (2)  
MBB 491 Capstone: Issues in Molecular Biosciences, L (2)  
PSY 399 Supervised Research (1-3)  
HSE 477 Human System Engineering Capstone Experience (3)  
SES 410 Senior Exploration Project I (3)  
SES 411 Senior Exploration Project II (3)  
SSH 402 Community Partnerships for Global Health, SB (3-9)  
SSH 405 Senior Seminar in Global Health (3)  
SSH 414 Urban and Environmental Health, SB (3)



TCL 305 Transborder Practicum and Field Research (3)  
 USL 496 Service Learning Capstone (3)

**E. Additional Program Requirements, if any:**

List and describe any capstone experiences, milestone, and/or additional requirements.

The capstone experience could take many forms-e.g., internship, directed study, thesis, research credit, capstone course, or applied project. For students completing the concurrent option, the capstone experience could be a course that the student is completing as part of the student's other degree.

**F. Concentrations**

- i. Are any concentrations to be established under this degree program? No, concentrations will not be established.
- ii. If yes, are concentrations required? (Select One)
- iii. List courses & additional requirements for the proposed concentration (s):

Concentration Name	Total credit hours	Core/Required Courses for Concentration (Prefix, # & Title)	Total Core credit hours	Program Specific Electives (include course name and prefix)	Total Elective credit hours	Additional Requirements (i.e. milestones, capstones)

**4. New Course Development**

**A. Will a new course prefix (es) be required for this degree program? No**

If yes, list prefix name(s) (i.e. ENG- English)

*Note: A request for a New Prefix form must be completed for each new prefix required and submitted with this proposal: [http://provost.asu.edu/files/shared/curriculum/Prefix\\_Request.doc](http://provost.asu.edu/files/shared/curriculum/Prefix_Request.doc).*

**B. New Courses Required for Proposed Degree Program.**

List all new courses required for this program, including course prefix, number and course description.

No new courses are required.

*Note: New course requests must be submitted electronically via [Curriculum ChangeMaker](#) and undergo all internal university review and approval steps including those at the unit, college, and university levels.*

**5. Program Need**

Explain why the university needs to offer this program (include target audience and market).

Regardless of major, every student graduating in the 21st century needs to know how to integrate and cohere particular STEM-like skills, which increasingly differ from those needed to succeed in the last century for a great many graduates in traditionally non-STEM degrees.

**6. Impact on Other Programs**

List other academic units that might be impacted by the proposed program and describe the potential impact (e.g., how the implementation of this program might affect student headcount/enrollment, student recruitment, faculty participation, course content, etc. in other programs). Attach letters of collaboration/support from impacted programs.

The impact on any one academic unit should be minimal because students in the program may take courses from a wide range of academic units. All of the courses for the degree are already offered by colleges across the four campuses.

Email attachment provided in Addendum showing approval from the CLS Curriculum Committee.

**7. Projected Enrollment**

How many new students do you anticipate enrolling in this program each year for the next five years?

<b>5-YEAR PROJECTED ANNUAL ENROLLMENT</b>					
	<b>1<sup>st</sup> Year</b>	<b>2<sup>nd</sup> Year</b> (Yr 1 continuing + new entering)	<b>3<sup>rd</sup> Year</b> (Yr 1 & 2 continuing + new entering)	<b>4<sup>th</sup> Year</b> (Yrs 1, 2 & 3 continuing + new entering)	<b>5<sup>th</sup> Year</b> (Yrs 1, 2, 3 & 4 continuing + new entering)
Number of Students Majoring (Headcount)	50	150	250	350	450

**8. Accreditation or Licensing Requirements**

If applicable, provide the names of the external agencies for accreditation, professional licensing, etc. that guide your curriculum for this program, if any. Describe any requirements for accreditation or licensing.

None.

**9. Faculty & Staff****A. Current faculty**

List the name, rank, highest degree, area of specialization/expertise and estimate of the level of involvement of all current faculties who will teach in the program.

Current faculty from many colleges are already offering the courses that students will complete.

**B. New Faculty:**

Describe the new faculty hiring needed during the next three years to sustain the program. List the anticipated hiring schedule and financial sources for supporting the addition of these faculty members.

No new faculty should be needed for the degree because students can be absorbed into the wide range of courses that are already offered.

**C. Administration of the program.**

Explain how the program will be administered for the purposes of admissions, advising, course offerings, etc. Discuss the available staff support.

Although the degree will be conferred by the College of Letters and Sciences, it will be administered by three colleges:  
College of Letters and Sciences (Polytechnic and Downtown Phoenix campuses)  
College of Liberal Arts and Sciences (Tempe campus)  
New College of interdisciplinary Arts and Sciences (West campus)

That is, each of the administering colleges will provide advising and related support on its respective campus.

A review committee, consisting of representatives from multiple campuses, will evaluate courses that colleges wish to add to the inaugural list of courses for the degree.

**10. Resources (necessary to launch and sustain the program)****A. Required resources:**

Describe any new resources required for this program's success, such as new support staff, new facilities, new library resources, new technology resources, etc.

For now, no new resources are needed. However, if the degree becomes popular, we may need to hire additional advisors in the future

**B. Resource acquisition:**

Explain how the resources to support this program will be obtained.

We will use standard enrollment-growth funding to pay for additional advising staff if that becomes necessary.

APPENDIX  
OPERATIONAL INFORMATION FOR UNDERGRADUATE PROGRAMS

(This information is used to populate the [Degree Search](#)/catalog website.)

**1. Program Name (Major):** Applied Quantitative Science**2. Program Description** (150 words maximum)

Students will learn to integrate and apply STEM-like skills that are increasingly in demand in the 21st century. Students who complete the applied quantitative science degree program will acquire the following six "habits of mind" related to 21st century skills. A habit of mind is a mental activity that becomes increasingly automatic over progress through the curriculum and extends into career development.

- effectively search through and evaluate information
- use sophisticated insight involving statistical inference and quantitative reasoning
- experiment creatively and in an informed manner in search of new insights
- apply and project quantitative reasoning to unfamiliar contexts
- critically and adaptably think about complex problems
- communicate well within and without the expert domain

This program is offered as a stand-alone degree on the Polytechnic campus.  
Students pursuing degrees on all four metropolitan area campuses can add this degree as a concurrent degree

**3. Contact and Support Information**

Building Name, code and room number: ( <a href="#">Search ASU map</a> )	CLS: SANCA 233 CLAS: FULTN 110 New College: FAB S105 480/727-1526
Program office telephone number: ( <i>i.e.</i> 480/965-2100)	cls@asu.edu clas@asu.edu MNSadvising@asu.edu SBSadvising@asu.edu
Program Email Address:	<a href="https://cls.asu.edu">https://cls.asu.edu</a> <a href="https://clas.asu.edu">https://clas.asu.edu</a> <a href="https://newcollege.asu.edu">https://newcollege.asu.edu</a>
Program Website Address:	

**4. Delivery/Campus Information Delivery:** On-campus only (ground courses and/or iCourses)

*Note: Once students elect a campus or On-line option, students will not be able to move back and forth between the on-campus and the ASU Online options. Approval from the Office of the University Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online.*

**5. Campus/Locations:** indicate all locations where this program will be offered.

X Polytechnic  
Downtown  
Phoenix  
Tempe  
West  
Other \_\_\_\_\_

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**6. Additional Program Description Information**

- A. Additional program fee required for this program? No
- B. Does this program have a second language No requirement?

**7. Career Opportunities & Concentrations**

Provide a brief description of career opportunities available for this degree program. If program will have concentrations, provide a brief description for each concentration. (150 words maximum)

Increasingly, employers are hiring people who know how to use quantitative information. By completing this degree program, students will equip themselves with 21st century skills and knowledge that will be appealing to employers. People who work in any business or industry needs to use quantitative skills to solve problems.

**8. Additional Admission Requirements**

If applicable list any admission requirements (freshman and/or transfer) that are higher than and/or in addition to the university minimum undergraduate admission requirements.)

We will use the university minimum undergraduate admission requirements.

**9. Keywords**

List all keywords used to search for this program. Keywords should be specific to the proposed program.

Quantitative data, quantitative information, analysis, critical thinking, reasoning, technical communication, statistics, data, professional communication

**10. Advising Committee Code**

List the existing advising committee code to be associated with this degree. UGLS06, UGLS07, UGLS09, UGNCMS, UGNCSB, CLADN

*Note: If a new advising committee needs to be created, please complete the following form: [Proposal to create an undergraduate advising committee](#)*

**11. First Required Math Course**

List the first math course required in the major map. MAT 142

**12. WUE Eligible:**

Has a request been submitted to the Provost by the Dean to consider this degree program as eligible for WUE? Yes

*Note: No action will be taken during the implementation process with regards to WUE until approval is received from the Provost.*

**13. Math Intensity:**

- a. List the highest math course required on the major map. (This will not appear on Degree Search.) MAT 142
- b. What is the math intensity as indicated by the highest math required on the major map? Math intensity categorization can be found here: <https://catalog.asu.edu/mathintensity> General

**14. CIP codes**

Identify CIP codes that should be displayed on Degree Search. CIP codes can be found at:

<http://www.onetonline.org/crosswalk/CIP/>.

27.0301 .....  
.....  
.....  
.....  
.....

Are any specific career codes (SOC/ONET codes) to be omitted from the CIP codes selected above?



(i.e. "Omit 25-10312.00 Engineering Teachers, Postsecondary from CIP code 14.0501 Bioengineering and Biomedical Engineering.")

**15. Area(s) of Interest**

A. Select **one (1)** primary area of interest from the list below that applies to this program.

[Architecture & Construction](#)

[Health & Wellness](#)

[Arts](#)

[Humanities](#)

[Business](#)

[Interdisciplinary Studies](#)

[Communications & Media](#)

[Law, Justice & Public Service](#)

[Computing & Mathematics](#)

[STEM](#)

[Education & Teaching](#)

[Science](#)

[Engineering & Technology](#)

[Social and Behavioral Sciences](#)

[Entrepreneurship](#)

[Sustainability](#)

[Exploratory](#)

B. Select **one (1)** secondary area of interest from the list below that applies to this program.

[Architecture & Construction](#)

[Health & Wellness](#)

[Arts](#)

[Humanities](#)

[Business](#)

[Interdisciplinary Studies](#)

[Communications & Media](#)

[Law, Justice & Public Service](#)

[Computing & Mathematics](#)

[STEM](#)

[Education & Teaching](#)

[Science](#)

[Engineering & Technology](#)

[Social and Behavioral Sciences](#)

[Entrepreneurship](#)

[Sustainability](#)

[Exploratory](#)

## **Addendum**

6) From: David Wells  
Sent: Friday, February 12, 2016 2:52PM  
To: Duane Roen; Patricia Rosciano; Sandra Chavez-Lopez; Pamela Stewart; Jenifer Boshes; Carlos Santos; Holly Huffman; Manuel Aviles-Santiago  
Subject: CLS Curriculum Committee: Concurrent and Stand Alone BS in Applied Quantitative Science

Duane,

Thank you for joining us to help clarify the degree and answer questions.

The CLS Curriculum Committee approved the concurrent BS in Applied Quantitative Science (24 hours)

The CLS Curriculum Committee approved the stand along BS in Applied Quantitative Science (36 hours) with the change that an advising hold be placed each semester before the student can register, so that an advisor can work with the student to help develop a coherent plan of study.

On behalf of the CLS Curriculum Committee, Dave,  
chair



## 2016 - 2017 Major Map

### Applied Quantitative Science, (Proposed)

ZVTMHWK

Hide Course List(s)/Track Group(s)

Term 1	0 - 16 Credit Hours	Critical course signified by	Hours	Minimum Grade	Notes
Mathematics (MA)			3		<ul style="list-style-type: none"> <li>SAT, ACT, Accuplacer, IELTS or TOEFL score determines placement into first-year composition courses</li> <li>ASU Mathematics Placement Test score determines placement into mathematics course</li> <li>ASU 101 or college-specific equivalent First-Year Seminar required of all freshman students</li> </ul>
ASU 101: The ASU Experience			1		
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition			3	C	
Social-Behavioral Sciences (SB)			3		
Complete 2 courses: Elective			6		
Term hours subtotal:			16		

Term 2	17 - 32 Credit Hours	Critical course signified by	Hours	Minimum Grade	Notes
Computer/Statistics/Quantitative Applications (CS)			3		
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition			3	C	
Humanities, Arts and Design (HU)			3		
Natural Science - Quantitative (SQ)			4		
Cultural Diversity in the U.S. (C)			3		
Term hours subtotal:			16		

Term 3	33 - 47 Credit Hours	Critical course signified by	Hours	Minimum Grade	Notes
Statistics			3	C	
Literacy and Critical Inquiry (L)			3		
Social-Behavioral Sciences (SB)			3		
Global Awareness (G)			3		
Elective			3		
Term hours subtotal:			15		

Term 4	48 - 63 Credit Hours	Critical course signified by	Hours	Minimum Grade	Notes
Data Skills			3	C	
Technical/Professional Communication			3	C	
Humanities, Arts and Design (HU)			3		
Natural Science - Quantitative (SQ) OR Natural Science - General (SG)			4		
Historical Awareness (H)			3		
Term hours subtotal:			16		

Term 5	64 - 78 Credit Hours	Necessary course signified by	Hours	Minimum Grade	Notes
Upper Division Statistics			3	C	
Upper Division Literacy and Critical Inquiry (L)			3		
Upper Division Social-Behavioral Sciences (SB) OR Upper Division Humanities, Arts and Design (HU)			3		
Complete 2 courses: Upper Division Major Electives			6	C	

Term hours subtotal: 15

<b>Term 6</b> ★	79 - 93 Credit Hours	Necessary course signified by	Hours	Minimum Grade	Notes
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★ Complete 2 courses: Upper Division Major Electives			6	C	
Complete 3 courses: Elective			9		

Term hours subtotal: 15

<b>Term 7</b> by ★	94 - 108 Credit Hours	Necessary course signified	Hours	Minimum Grade	Notes
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★ Complete 2 courses: Upper Division Major Electives			6	C	
Complete 3 courses: Upper Division Elective			9		

Term hours subtotal: 15

<b>Term 8</b> by ★	109 - 120 Credit Hours	Necessary course signified	Hours	Minimum Grade	Notes
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★ Upper Division Capstone/Project			3	C	
Complete 2 courses: Upper Division Elective			6		
Upper Division Major Electives			3	C	

Term hours subtotal: 12

- Courses represented in track groups are not exhaustive. Please visit the College of Letters & Sciences website for a full list of acceptable courses on all campuses.

Technical/Professional Communication	Statistics	Data Skills
AME 112: Computational Thinking for Digital Culture	ABS 350: Applied Statistics (CS)	ACO 100: All About Data: Design, Query, and Visualization (CS)
AME 194: Intro to Digital Culture	BIO 415: Biometry	ACO 220: Introduction to Database Systems (CS)
AML 330: Social Simulation (CS)	ECN 221: Business Statistics (CS)	BIO 355: Introduction to Computational Molecular Biology (CS)
COM 459: Theory and Methods of Social Media Networks	ECN 410: Applied Regression Analysis and Forecasting	BIO 406: Computer Applications in Biology
ENG 351: Emerging Digital Media	POS 401: Political Statistics (CS)	BIO 411: Quantitative Methods in Conservation and Ecology
ENG 370: Science, Values, and the Public	PSY 230: Introduction to Statistics (CS)	BIO 417: Experimental Design
ENG 483: Methods of Teaching Secondary Literature and Language	PSY 330: Statistical Methods (CS)	BIO 435: Research Techniques in Animal Behavior
GIT 135: Graphic Communications	SOC 390: Social Statistics I (CS)	CHM 325: Analytical Chemistry
GIT 210: Creative Thinking and Design Visualization	STP 220: Conceptual Statistics	CHM 326: Advanced Analytical Chemistry Laboratory
GIT 303: Digital Publishing	STP 226: Elements of Statistics (CS)	CHM 327: Instrumental Analysis
GIT 312: 3-D Computer Graphics Modeling and Representation (CS)	STP 231: Statistics for Life Science (CS)	CHM 328: Instrumental Analysis Laboratory
IAP 361: Digital Editing and Media Literacy (CS)	STP 420: Introductory Applied Statistics (CS)	CHM 392: Introduction to Research Techniques
TWC 301: Fundamentals of Writing for Digital Media (L)	STP 429: Experimental Statistics (CS)	CPI 101: Introduction to Informatics (CS)
TWC 347: Written Communication for Managers (L)	STS 401: Statistics in Science and Technology Studies (CS)	ENG 390: Methods of Inquiry
TWC 411: Principles of Visual Communication (L)		GCU 351: Population Geography (SB & G)
TWC 414: Visualizing Data and Information		GLG 410: Computers in Geology (CS)
		PAF 302: Public Service Research Methods

Hide Course List(s)/Track Group(s)

POS 301: Empirical Political Inquiry  
(SB)

PSY 290: Research Methods (L or  
SG)

PSY 304: Effective Thinking (L)

PSY 390: Experimental Psychology  
(L)

PSY 399: Supervised Research

PSY 471: Psychological Testing

SOC 333: Population (SB & G)

SOC 391: Research Methods (L or  
SB)

SOC 433: Applied Demography (SB)

STP 310: Design and Analysis of  
Experiments

STS 301: Research in Science and  
Technology Studies (SB)

Capstone/Project

ARS 498: Special Topics

BIS 484: Internship

CCS 499: Individualized Instruction

ENG 494: Special Topics

GIT 480: Senior Project

GLG 495: Undergraduate Thesis

HON 492: Honors Directed Study

HON 493: Honors Thesis (L)

HRC 480: Capstone: Practices and  
Approaches

PSY 399: Supervised Research

PSY 477: Applied Capstone  
Experience

STS 304: Science, Technology, and  
Society (SB)

**Total Hours:** 120

**Upper Division Hours:** 45 minimum

**Major GPA:** 2.00 minimum

**Cumulative GPA:** 2.00 minimum

**Total hrs at ASU:** 30 minimum

**Hrs Resident Credit for**

**Academic Recognition:** 56 minimum

**Total Community College Hrs:** 64 maximum

#### General University Requirements Legend

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2016 - 2017 academic year.