

Department of Computing, Mathematics, and Physics

Actuarial Science (B.S.)

| Major requirements ACSC | Credits |
|--|---------|
| ACCT 131 Survey of Accounting | 3 |
| CIS 181 Computer Programming I | 3 |
| PHYS 211 General Physics I | 4 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 211 Calculus III | 4 |
| MATH 196 Mathematics Seminar | 2 |
| MATH 198 Introduction to Mathematical Proof | 2 |
| MATH 261 Linear Algebra | 3 |
| MATH 412 Real Analysis | 3 |
| MATH 350 Mathematics of Finance | 3 |
| MATH 496 Mathematics Capstone* | 2 |
| STAT 291 Probability and Statistics | 3 |
| STAT 292 Inferential Statistics | 3 |
| STAT 417 Mathematical Statistics | 3 |
| <i>Three credits from the following (3):</i> DASC 421 Advanced Statistical Methods STAT 325 Experimental design | 3 |
| ECON 120 Principles of Macroeconomics | 3 |
| ECON 220 Principles of Microeconomics | 3 |
| FINA 305 Financial Management | 3 |
| <i>Three credits from the following (3):</i> FINA 307 Money and Financial Markets (3) FINA 351 Investments (3) FINA 405 Corporate Finance (3) | 3 |
| INTE 391 Internship | 3 |

*Fulfills Writing in the major requirement.

| Experiential Learning requirement | met/major |
|--|--------------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111) | met by major |
| Laboratory Science (PHYS 211) | met by major |
| Science, Technology & the World | waived |
| Social Science (ECON 120) | met by major |
| European or U.S. History | 3 |
| Literature | 3 |
| Philosophy and Religion | 3 |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | 2-3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness | 1 |
| Ethics, World Views, or Pluralism | 3 |
| | |
| QuEST requirements | 42-43 |
| Major requirements | 64 |
| Free electives | 17-16 |
| Total | 123 |

Computer Science (B.S.)

| Major requirements COSC | Credits |
|--|----------|
| CIS 160 Introduction to Computer Science & Cybersecurity | 3 |
| CIS 181 Computer Programming I | 3 |
| CIS 281 Programming for User Interaction | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 285 Data Structures | 3 |
| CIS 325 Data Communications and Networking | 3 |
| CIS 332 Database Concepts | 3 |
| CIS 335 Software Engineering | 3 |
| CIS 281 Programming for User Interaction | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 384 Elements of Computing Systems | 3 |
| CIS 387 Analysis of Algorithms | 3 |
| CIS 385 Data Structures and Algorithms | 3 |
| CIS 416 Operating Systems and Computer Architecture | 3 |
| CIS 418 Machine Learning | 3 |
| CIS 471 Application Development I (capstone) | 3 |
| CIS 472 Application Development II (capstone) | 3 |
| CIS 482 Organization of Programming Languages | 3 |
| CIS 487 Interactive 3D Graphics | 3 |
| <i>Four credits from the following (Junior/Senior year)</i> INTE 394 Internship (4-12 credits)** INTE 391 Internship (1-3 credits)** | 4 |
| MATH 111 Calculus I | 4 |
| MATH 180 Discrete Math | 3 |
| MATH 261 Linear Algebra | 3 |
| <i>Four credits from the following:</i> PHYS 201 Introductory Physics I (4) PHYS 202 Introductory Physics II (4) (recommended) PHYS 211 General Physics I (4) | 4 |
| STAT 291 Probability and Statistics | 3 |

| Experiential Learning requirement (INTE 391/394) | met/major |
|--|------------|
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing (CIS 181, MATH 111, 180) | met/major |
| Science with Lab (PHYS 201, 202 or 211) | met/major |
| Social Scientific Ways of Knowing | |
| <i>Two of the following (6 credits total):</i> Social Science HIST 1xx HIST 2xx | 6 |
| Literary & Aesthetic Ways of Knowing | 3 |
| Philosophy or Religion | 3 |
| Language | 6 |
| Intercultural Global* or International Cross-cultural* or 3rd language | 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| Gen Ed requirements | 46-47 |
| Major requirements (inclusive of concentration) | 69 |
| Free electives | 8-7 |
| Total credits | 123 |

CIS 472 Fulfills Writing in the major requirement.

**INTE 394 and INTE 391 must be taken for a letter grade to fulfill Major requirement.
 CIS 471 & 472 Capstone courses

Software Development (B.S.)

| Major requirements SODE | Credits |
|--|---------|
| CIS 160 Introduction to CS and Cybersecurity | 3 |
| CIS 181 Computer Programming I | 3 |
| CIS 191 Web Development: Client Side | 3 |
| CIS 281 Programming for User Interaction | 3 |
| CIS 283 Business Systems Applications | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 285 Data Structures | 3 |
| CIS 291 Web Development: Server Side | 3 |
| CIS 332 Database Concepts | 3 |
| CIS 335 Software Engineering | 3 |
| CIS 387 Data Structures and Algorithms | 3 |
| CIS 471 Application Development I (capstone) | 3 |
| CIS 472 Application Development II (capstone) | 3 |
| MATH 180 Discrete Mathematics | 3 |
| <i>Three credits from the following (Systems Operations):</i> CIS 251 Hardware and Software (3) CIS 255 NIX System Administration and Security (3) CIS 384 Elements of Computing Systems (3) | 3 |
| <i>Six credits from the following (Specialized Development):</i> CIS 315 Introduction to Mobile Application Design (3) CIS 325 Data Communications and Networking CIS 416 Operating Systems & Computer Architecture (3) CIS 418 Machine Learning (3)* CIS 482 Organization of Programming Languages (3) CIS 487 Interactive 3D Graphics (3)* | 6 |
| <i>Four credits from the following (Junior/Senior year)</i> INTE 394 Internship (4-12 credits)** INTE 391 Internship (1-3 credits)** 4 | |
| <i>Three to four credits from:</i> MATH 111 Calculus I (4) STAT 269 Introductory Statistics (3) STAT 281 Applied Statistics for Management (3) | 3-4 |

| Experiential Learning requirement (INTE 391/394) | met/major |
|---|------------|
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing (CIS 181, MATH 180) | met/major |
| Science with Lab | 3 or 4 |
| Social Scientific Ways of Knowing | |
| <i>Two of the following (6 credits total):</i> Social Science HIST 1xx* or 2xx* | 6 |
| Literature or Arts | 3 |
| Philosophy or Religion | 3 |
| Language | 6 |
| Second Semester of Language | 3 |
| Intercultural Global* or International Cross-cultural* or 3rd language | 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| Gen Ed requirements | 46-47 |
| Major requirements (inclusive of concentration) | 58-59 |
| Free electives | 19-17 |
| Total credits | 123 |

**INTE 394 and INTE 391 must be taken for a letter grade to fulfill Major requirement.
CIS 472 Fulfills Writing in the major requirement.

CIS 471& 472 Capstone Courses

* Requires extra pre-req (MATH 111, MATH 261 and/or STAT 291)

Computer Science with Secondary Teaching Certification (B.A.)

| Major requirements CIST | Credits |
|---|---------|
| CIS 160 Introduction to Computer Science and Cybersecurity | 3 |
| CIS 181 Computer Programming I | 3 |
| CIS 191 Web Development: Client Side | 3 |
| CIS 251 Hardware and Software | 3 |
| CIS 283 Business Systems Applications | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 285 Data Structures | 3 |
| CIS 291 Web Development: Server Side | 3 |
| CIS 325 Data Communications and Networking | 3 |
| CIS 332 Database Concepts | 3 |
| CIS 335 Software Engineering | 3 |
| CIS 384 Elements of Computing Systems | 3 |
| CIS 387 Analysis of Algorithms | 3 |
| HDFS 311 Adolescent Development | 3 |
| EDSP 207 Introduction to Special Education | 3 |
| EDSP 307 Inclusion Practices | 3 |
| EDUC 203 Educational Psychology | 3 |
| EDUC 208 Teaching English Language Learners in K-12 Sch | 3 |
| EDUC 331 Instructional Design & Assessment for Middle and Secondary Grades* | 3 |
| EDUC 346 Socio-Cultural Perspectives on Education | 3 |
| ENGL 122-176 Literature fulfilling QuEST | 3 |
| MATH 307 Teaching Secondary Mathematics and Computer Science | 2 |
| MATH 180 Discrete Math | 3 |
| STAT 269 Introductory Statistics | 3 |
| TEP 210 Sophomore Field Experience | 0 |
| TEP 310 Junior Field Experience | 0 |
| Professional semester | |
| EDUC 420 Professional Issues in Education | 2 |
| TEP 407 Student Teaching Seminar | 1 |
| TEP 410 Secondary Pre-Student Teaching Experience | 0 |
| TEP 435 Student Teaching: Secondary | 9 |

| Experiential Learning requirement (TEP 435) | met/major |
|---|------------|
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing (CIS 181, MATH 180) | met/major |
| Science with Lab | 3 or 4 |
| Social Scientific Ways of Knowing | |
| <i>Two of the following (6 credits total):</i> Social Science HIST 1xx* or 2xx* | 6 |
| Literature or Arts | 3 |
| Philosophy or Religion | 3 |
| Language | 6 |
| Second Semester of Language | 3 |
| Intercultural Global* or International Cross-cultural* or 3rd language | 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| Gen Ed requirements | 27-38 |
| Major requirements (inclusive of concentration) | 58-58 |
| Free electives | 3-2 |
| Total credits | 123 |

Capstone course for major = EDUC 420

*Fulfills writing in the major requirement

Cybersecurity (B.S.)

| Major requirements CYSE | Credits |
|---|---------|
| CIS 160 Intro to CS and Cybersecurity | 3 |
| CIS 181 Computer Programming I | 3 |
| CIS 255 NIX System Administration and Security | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 285 Data Structures | 3 |
| CIS 325 Data Communications and Networking | 3 |
| CIS 332 Database Concepts | 3 |
| CIS 355 Network Security | 3 |
| CIS 357 Info Assurance and Risk Management | 3 |
| CIS 373 Cloud Computing | 3 |
| CIS 381 Information Systems and Managers | 3 |
| CIS 421 Cybersecurity Architecture | 3 |
| CIS 474 Digital Forensics | 3 |
| CIS 494 Cybersecurity Capstone | 3 |
| <i>One of the following options: ("Technical Track"):</i> CIS 384 Elements of Computer Systems (3) CIS 416 Operation Systems & Computer Architecture (3) CIS 484 Ethical Hacking (3) <i>Or 9 credits from the following ("Policy Track")</i> BUSA 120 Principles of Management (3) BUSA 381 Business Law (3) BUSA 405 Supply Chain Management (3) CRIJ 103 Crime, Justice & Society (3) CRIJ 362 Criminology (3) POLI 323 Public Policy (3) | 9 |
| <i>Four credits from the following:</i> INTE 391 Internship (1-3)** INTE 394 Internship (4-12) | 4 |
| MATH 180 Discrete Mathematics | 3 |
| <i>Three credits from the following:</i> STAT 269 Introductory Statistics (3) STAT 281 Applied Statistics for Management (3) STAT 291 Probability and Statistics (3) | 3 |

| Experiential Learning requirement (INTE 391/394) | met/major |
|--|-----------|
| QuEST requirements | |
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing (CIS 181, MATH 180) | met/major |
| Science with Lab | 3-4 |
| Social Scientific Ways of Knowing | |
| <i>Two of the following (6 credits total):</i> Social Science HIST 1xx HIST 2xx | 6 |
| Literary & Aesthetic Ways of Knowing | 3 |
| Philosophy or Religion | 3 |
| Language | 6 |
| Intercultural Global* or International Cross-cultural* or 3rd language | 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| Gen Ed requirements | 46-47 |
| Major requirements (inclusive of concentration) | 58 |
| Free electives | 19-18 |
| Total credits | 123 |
| | |
| | |

**INTE 391 must be taken for a letter grade to fulfill major requirement

Data Science (B.S.)

| Major requirements DASC | Credits |
|--|---------|
| CIS 181 Computer Programming I | 3 |
| CIS 284 Computer Programming II | 3 |
| CIS 332 Database Concepts | 3 |
| CIS 285 Data Structures | 3 |
| CIS 418 Artificial Intelligence | 3 |
| DASC 2xx Intro to Data Science | 3 |
| DASC 345 Time Series Analysis | 3 |
| DASC 421 Advanced Statistical Methods | 3 |
| INTE 391 Internship | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 261 Linear Algebra | 3 |
| MATH 496 Mathematics Capstone | 2 |
| STAT 291 Probability and Statistics | 3 |
| STAT 292 Inferential Statistics | 3 |
| STAT 325 Experimental Design | 3 |
| STAT 331 Nonparametric Statistical Methods | 3 |
| | |
| | |
| | |

| Experiential Learning requirement (INTE 391) | met/major |
|--|------------|
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing | met/major |
| Science with Lab | 3-4 |
| Social Scientific Ways of Knowing | |
| Two of the following (6 credits total): Social Science HIST 1xx HIST 2xx | 6 |
| Literary & Aesthetic Ways of Knowing | 3 |
| Philosophy or Religion | 3 |
| Language | 6 |
| Intercultural Global* or International Cross-cultural* | 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| | |
| | |
| Gen Ed requirements | 46-47 |
| Major requirements | 52 |
| Free electives | 25-24 |
| Total | 123 |

MATH 496: Fulfills Writing in the major requirement

Digital Media (B.A.) Mobile Application and Game Design concentration

| Major requirements DIGM-MAGD | Credits |
|---|---------|
| DIGM 105 Foundations in Creative Digital Media | 3 |
| DIGM 210 Video and Church Media Seminar | 1 |
| DIGM 215 Game and Art Design Seminar | 1 |
| <i>Nine credits from the following:</i> ART 121 Form, Space, & Media (3) ART 171 Drawing I (3) ART 182 Color and Composition (3) ART 217 Digital Imaging (3) ART 251 Darkroom Photography (3) ART 336 Interactive Design (3) ART 352 Digital Photography (3) ART 431 Motion Design (3) <i>One of the following:</i> ARTH 151 Art History: 1400-21 st Century (3) ARTH 205 Design History and Theory (3) ARTH 209 History of Modern Art (3) | 9 |
| <i>Three credits from the following:</i> ARTH 210 Topics in Non-Western Art (3) COMM 321 Global Indigenous Media (3) COMM 327 Latin American Cinema (3) | 3 |
| CIS 160 Intro to CS and Cybersecurity | 3 |
| CIS 181 Computer Programming I | 3 |
| CIS 191 Web Development: Client Side | 3 |
| COMM 203 Basic Video and Editing Techniques | 3 |
| COMM 217 Introduction to Film | 3 |
| COMM 382 History and Theory of Digital Media* | 3 |
| DIGM 490 Senior Seminar and Project | 4 |
| MUCM 353 Sound Design | 3 |
| Six credits of Digital Media Electives** (list on next page) | 6 |
| Mobile Applications and Game Design concentration (15) | |
| CIS 281 Programming for User Interaction | 3 |
| CIS 287 Introduction to Game Design | 3 |
| CIS 291 Web Development: Server Side | 3 |
| CIS 315 Introduction to Mobile Application Design | 3 |
| CIS 332 Database Concepts | 3 |

| Experiential Learning requirement (INTE 391/394) | met/major or |
|---|--------------|
| General Education & Common Learning requirements | |
| First Year Seminar | 3 |
| Written Communication | 3 |
| Oral Communication | 3 |
| Mathematical and Scientific Ways of Knowing (CIS 181) | met/major |
| Science with Lab | 3 or 4 |
| Social Scientific Ways of Knowing | |
| <i>Two of the following (6 credits total):</i> Social Science HIST 1xx* or 2xx* | 6 |
| Literature or Arts | waived |
| Philosophy or Religion | 3 |
| Language | 6 |
| Second Semester of Language | 3 |
| Intercultural Global* (ARTH 210, COMM 321, COMM 327) or International Cross-cultural* or 3rd language | met/major or |
| Bible | 3 |
| Christian Beliefs | 3 |
| Holistic Wellness | 1 |
| Ethics and the Common Good | 3 |
| Intercultural U.S.* or Domestic Cross-cultural* | 3 |
| Gen Ed requirements | 40-41 |
| Major requirements (inclusive of concentration) | 63 |
| Free electives | 20-19 |
| Total credits | 123 |

*Fulfills Writing in the major requirement.

**Courses taken to fulfill a major requirement cannot also count towards the six credits of Digital Media electives requirement.

List of Digital Media electives on the next page.

List of approved Digital Media Electives

ART 171 Drawing I (3)
ART 182 Color and Composition (3)
ART 217 Digital Imaging (3)
ART 236 Design Thinking and Visual Culture (3)
ART 237 Typography (3)
ART 251 Darkroom Photography (3)
ART 336 Interactive Design (3)
ART 337 Graphic Design & Prof Pract (3)
ART 338 Digital Illustration (3)
ART 347 Service Centered Design (3)
ART 352 Digital Photography (3)
ART 382 Topics in Graphic Design (3)
ART 386 Typography II (3)
ART 420 Designer as Author (3)
ART 431 Motion Design (3)
ARTH 150 Art History: Prehistory-1400 (3)
ARTH 151 Art History: 1400-21st Century (3)
ARTH 205 Design History and Theory (3)
ARTH 209 History of Modern Art (3)
ARTH 309 Contemporary Art: 1945 – Present (3)
CIS 284 Computer Programming II (3)
CIS 285 Data Structures (3)^{***}
CIS 287 Introduction to Game Design (3)
CIS 291 Web Development: Server Side (3)
CIS 315 Intro to Mobile App Design (3)^{***}
CIS 332 Database Concepts (3)^{***}
CIS 381 Info Systems & Managers (3)
COMM 205 Principles of Strategic Public Relations (3)
COMM 218 Mass Media and Society (3)
COMM 220 Advanced Cinematography & Lighting Techniques (3)^{***}
COMM 251 Film History I (3)^{***}
COMM 252 Film History II (3)^{***}
COMM 254 Screenwriting I (3)
COMM 255 Screenwriting II (3)
COMM 310 Fundraising Principles and Strategies (3)
COMM 317 Advanced Editing and Effects (3)^{***}
COMM 328 Methods and Issues in Film Studies (3)^{***}
COMM 341 Communication Theory (3)
COMM 342 Intercultural Communication (3)
COMM 353 Crisis Communication (3)
COMM 357 Event Planning (3)
COMM 363 Documentary and Promotional Film (3)
COMM 380 Advanced Topics in Film Production (3)^{***}
INTE 391 Internship (1-3)^{****}
INTE 394 Internship (4-12)^{****}
THEA 115 Production Practicum (1)
THEA 150 Intro to Tech Theatre & Design (3)
THEA 250 Stage Management (3)
THEA 350 Scenographic Techniques (3)

^{***} This course requires prerequisite(s), which may increase the total credits required for the major.

^{****}INTE 394 must be taken for a letter grade to fulfill Major requirement.

Mathematics (B.A.)

| Major requirements MATH | Credits |
|--|---------|
| CIS 181 Computer Programming I | 3 |
| ECON 120 Principles of Macroeconomics | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 196 Mathematics Seminar | 2 |
| MATH 198 Introduction to Mathematical Proof | 2 |
| MATH 211 Calculus III | 4 |
| MATH 261 Linear Algebra | 3 |
| MATH 308 Differential Equations | 3 |
| MATH 362 Algebraic Structures | 3 |
| MATH 412 Introduction to Real Analysis | 3 |
| MATH 496 Mathematics Capstone* | 3 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| STAT 291 Probability and Statistics | 3 |
| STAT 292 Inferential Statistics | 3 |
| <i>Nine additional credits from the following:</i> | 9 |
| MATH 301 Numerical Analysis (3) | |
| MATH 341 Mathematical Modeling (3) | |
| MATH 342 Applied Combinatorics (3) | |
| MATH 350 Mathematics of Finance I (3) | |
| MATH 382 Geometry (3) | |
| MATH 392 History of Mathematics (3) | |
| MATH 405 Introduction to Mathematical Research (3) | |
| MATH 422 Mathematics Research (1-3)** | |
| MATH 490 Topics in Mathematics (3) | |
| MATH 491 Independent Study (1-3) | |
| ENGR 365 Linear Systems (3) | |
| Any STAT 3xx or 4xx course (not to exceed 6 credits) | |

*Fulfills Writing in the major requirement.

**Up to 3 credits may count towards the nine credits of selectives.

| Experiential Learning requirement | |
|---|------------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (CIS 181, MATH 111) | met/major |
| Laboratory Science (PHYS 211, 212) | met/major |
| Science, Technology & the World | waived |
| Social Science (ECON 120) | met/major |
| European History or United States History | 3 |
| Literature | 3 |
| Philosophy and Religion | 3 |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | 2 or 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness course | 1 |
| Ethics, World Views or Pluralism | 3 |
| | |
| QuEST requirements | 42-43 |
| Major requirements | 60 |
| Free electives | 21-20 |
| Total credits | 123 |

Note: Students in the mathematics and mathematics with teaching certification majors are encouraged to complete the sequence ECON 120: Principles of Macroeconomics and ECON 220: Principles of Microeconomics. The study of economics provides an excellent foundation for many careers in mathematical sciences. A double-major or minor in economics is a strong, marketable addition to the mathematics major, and either combination can be completed in 8 semesters.

Mathematics with Secondary Teaching Certification (B.A.)

| Major requirements MATT | Credits |
|--|---------|
| CIS 181 Computer Programming I | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 196 Mathematics Seminar | 2 |
| MATH 198 Introduction to Mathematical Proof | 2 |
| MATH 211 Calculus III | 4 |
| MATH 261 Linear Algebra | 3 |
| MATH 307 Teaching Secondary Mathematics and Computer Science | 2 |
| MATH 308 Differential Equations | 3 |
| MATH 362 Algebraic Structures | 3 |
| MATH 382 Geometry | 3 |
| MATH 412 Introduction to Real Analysis | 3 |
| MATH 496 Mathematics Capstone* | 2 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| STAT 291 Probability and Statistics | 3 |
| STAT 292 Inferential Statistics | 3 |
| EDSP 207 Introduction to Special Education | 3 |
| EDSP 307 Inclusion Practices | 3 |
| EDUC 203 Educational Psychology | 3 |
| EDUC 208 Teaching English Language Learners in K-12 Sch | 3 |
| EDUC 331 Instructional Design & Assessment for Middle and Secondary Grades | 3 |
| EDUC 346 Socio-Cultural Perspectives in Education | 3 |
| ENGL 122 to ENGL 176 meeting QuEST literature | 3 |
| HDFS 311 Adolescent Development | 3 |
| TEP 210 Sophomore Field Experience | 0 |
| TEP 310 Junior Field Experience | 0 |
| Professional semester | |
| EDUC 420 Professional Issues in Education | 2 |
| TEP 407 Student Teaching Seminar | 1 |
| TEP 410 Secondary Pre Student Teaching Experience | 0 |
| TEP 435 Student Teaching: Secondary | 9 |

| Experiential Learning requirement | |
|---|-----------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111, CIS 181, CIS 191) | met/major |
| Laboratory Science (PHYS 211 or 212) | met/major |
| Science, Technology & the World | waived |
| Social Science (EDUC 203) | met/major |
| European History or United States History | 3 |
| Literature (ENGL 122 – 176) | met/major |
| Philosophy and Religion | 3 |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | 2 or 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness course | 1 |
| Ethics, World Views or Pluralism (EDUC 346) | met/major |
| | |
| QuEST requirements | 36-37 |
| Major requirements | 88 |
| Total credits | 124-125 |

*Fulfills Writing in the major requirement.

Note: Students considering secondary mathematics teaching as one of several career options in mathematical sciences are encouraged to complete an additional 6 credits of MATH/STAT 3xx/4xx courses. This allows you to graduate with a Mathematics degree in addition to Teaching Certification.

Physics (B.A.)

| Major requirements PHYS-BA | Credits |
|---|---------|
| CHEM 105 General Chemistry I | 4 |
| ENGR 212 Programming for Engineers | 2 |
| ENGR 367 Electromagnetics | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 211 Calculus III | 4 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| PHYS 251 Modern Physics | 4 |
| PHYS 317 Optics | 3 |
| PHYS 328 Classical Mechanics | 3 |
| PHYS 402 Quantum Mechanics | 3 |
| PHYS 494 Senior Physics Seminar* | 2 |
| SCIE 495 Capstone: Natural Sciences | 3 |
| <i>Three credits from the following (3):</i> ENGR 213 Engineering Statistics (3) STAT 291 Probability and Statistics (3) | 3 |
| <i>One of the following:</i> ENGR 371 Thermodynamics (3) CHEM 437 Physical Chemistry I (3.5) | 3 – 3.5 |
| <i>One of the following options:</i> MATH 270 Linear and Differential Methods (3) or MATH 261 Linear Algebra (3) and MATH 308 Differential Equations (3) | 3 – 6 |
| <i>Three credits from the following (3):</i> PHIL 101 Problems in Philosophy (3) or PHIL 102 History of Philosophy (3) | 3 |

*Fulfills Writing in the major requirement.

| Experiential Learning requirement | |
|---|------------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111) | met/major |
| Laboratory Science (PHYS 211 or 212) | met/major |
| Science, Technology & the World | waived |
| Two of the following (6 credits total): Social Science European History United States History | 6 |
| Literature | 3 |
| Philosophy and Religion (PHIL 101 or 102) | met/major |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | 2 or 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness course | 1 |
| Ethics, World Views or Pluralism | 3 |
| | |
| | |
| QuEST requirements | 42-43 |
| Major requirements | 59-62.5 |
| Free electives | 22-17.5 |
| Total credits | 123 |

Note: Students may complete a double major in Mathematics and Physics (BA) by completing all courses listed in each major, subject to the following criteria. This is an exception to the standard college course overlap policy. For a double-major in MATH and PHYS (BA), a student must:

- Complete MATH 261 and MATH 308 in lieu of MATH 270
- Complete STAT 291 (not ENGR 342)
- The student may choose one of (MATH 494, PHYS 494) and is not required to complete both.

Physics (B.S.)

| Major requirements PHYS-BS | Credits |
|--|---------|
| CHEM 105 General Chemistry I | 4 |
| ENGR 212 Programming for Engineers | 2 |
| ENGR 367 Electromagnetics | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 211 Calculus III | 4 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| PHYS 251 Modern Physics | 4 |
| PHYS 317 Optics | 3 |
| PHYS 328 Classical Mechanics | 3 |
| PHYS 402 Quantum Mechanics | 3 |
| PHYS 421 Particle Physics | 3 |
| PHYS 425 Solid State Physics | 3 |
| PHYS 494 Senior Physics Seminar* | 2 |
| SCIE 495 Capstone: Natural Sciences | 3 |
| <i>Three credits from the following:</i> ENGR 213 Engineering Statistics (3) STAT 291 Probability and Statistics (3) | 3 |
| <i>One of the following:</i> ENGR 371 Thermodynamics (3) or CHEM 437 Physical Chemistry I (3.5) | 3- 3.5 |
| <i>One of the following options:</i> MATH 270 Linear and Differential Methods (3) or MATH 261 Linear Algebra (3) and MATH 308 Differential Equations (3) | 3-6 |
| <i>Three credits from the following:</i> PHIL 101 Problems in Philosophy (3) PHIL 102 History of Philosophy (3) | 3 |
| <i>Three credits from the following:</i> CIS 284 Computer Programming II (3) SCIE 393 Research Methods in the Sciences (1) ENGR 324 Control Systems (4) ENGR 365 Linear Systems (3) ENGR 373 Fluid Mechanics (4) PHYS 322 Independent Research (1-3) PHYS 422 Senior Research (1-3) | 3-4 |

| Experiential Learning requirement | |
|---|------------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111) | met/major |
| Laboratory Science (PHYS 211 or 212) | met/major |
| Science, Technology & the World | waived |
| Two of the following (6 credits total): Social Science European History United States History | 6 |
| Literature | 3 |
| Philosophy and Religion (PHIL 101 or 102) | met/major |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | 2 or 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness course | 1 |
| Ethics, World Views or Pluralism | 3 |
| | |
| | |
| QuEST requirements | 42-43 |
| Major requirements | 68-72.5 |
| Free electives | 13-7.5 |
| Total credits | 123 |

*Fulfills Writing in the major requirement.

Physics with Secondary Teaching Certification (B.A.)

| Major requirements PHYT | Credits |
|---|---------|
| CHEM 105 General Chemistry I | 4 |
| ENGR 212 Programming for Engineering | 2 |
| EDUC 203 Educational Psychology | 3 |
| EDUC 208 Teaching English Language Learners in K-12 Sch | 3 |
| EDUC 331 Instructional Design and Assessment for Middle and Secondary Grades | 3 |
| EDUC 346 Socio-cultural Perspectives on Education | 3 |
| EDSP 207 Introduction to Special Education | 3 |
| EDSP 307 Inclusion Practices | 3 |
| ENGL122-176 Literature meeting QuEST requirements | 3 |
| ENGR 213 Engineering Statistics (3) or STAT 291 Probability and Statistics (3) | 3 |
| ENGR 367 Electromagnetics | 3 |
| ENGR 371 Thermodynamics | 3 |
| HDFS 311 Adolescent Development | 3 |
| MATH 111 Calculus I | 4 |
| MATH 112 Calculus II | 4 |
| MATH 211 Calculus III | 4 |
| <i>One of the following options:</i> MATH 270 Linear and Differential Methods (3) or MATH 261 Linear Algebra (3) and MATH 308 Differential Equations (3) | 3-6 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| PHYS 251 Modern Physics | 4 |
| PHYS 317 Optics | 3 |
| PHYS 328 Classical Mechanics | 3 |
| PHYS 402 Quantum Mechanics | 3 |
| PHYS 494 Senior Physics Seminar* | 2 |
| PHIL 101 Problems in Philosophy (3) or PHIL 102 History of Philosophy (3) | 3 |
| SCIE 307 Teaching Lab Sciences in Secondary Education | 1 |
| SCIE495 Capstone: Natural Sciences | 3 |
| TEP 210 Sophomore Field Experience | 0 |
| TEP 310 Junior Field Experience | 0 |

| Professional semester | |
|--|----------------|
| EDUC 420 Professional Issues in Education | 2 |
| TEP 407 Student Teaching Seminar | 1 |
| TEP 410 Secondary Pre-Student Teaching Experience | 0 |
| TEP 435 Student Teaching: Secondary | 9 |
| Experiential Learning requirement | |
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111) | met/major |
| Laboratory Science (PHYS 211, 212) | met/major |
| Science, Technology & the World | waived |
| Social Science (EDUC 203) | met/major |
| European History or United States History | 3 |
| Literature (ENGL 122 – 176) | met/major |
| Philosophy and Religion (PHIL 101 or 102) | met/major |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language or Cross Cultural | 3 |
| Non-Western Studies | waived |
| Bible | 3 |
| Christian Beliefs (THEO 223 required to waive Non-western) | 3 |
| Wellness course | 1 |
| Ethics, World Views or Pluralism (EDUC 346) | met/major |
| | |
| QuEST requirements | 31 |
| Major requirements | 96-99 |
| Total | 127-130 |

*Fulfills Writing in the major requirement.

Note: Students who are considering secondary physics teaching as one of several career options are encouraged to complete an additional six credits of ENGR 367 and ENGR 371. This allows you to graduate with a Physics degree, if you choose, while still maintaining Pennsylvania Secondary Teaching Certification.

Mathematics and Physics (B.A.) (double major – not an official major)

| Major requirements | Credits |
|---|---------|
| CHEM 105 General Chemistry I | 4 |
| SCIE495 Capstone Natural Sciences | 3 |
| CIS 181 Computer Programming I | 3 |
| ECON 120 Introduction to Macroeconomics | 3 |
| ENGR 367 Electromagnetics | 3 |
| MATH 111 Calculus I (possible addition of MATH 103 Supplementary Calculus) | 4-5 |
| MATH 112 Calculus II | 4 |
| MATH 196 Mathematics Seminar | 2 |
| MATH 198 Introduction to Mathematical Proof | 2 |
| MATH 211 Calculus III | 4 |
| MATH 261 Linear Algebra | 3 |
| MATH 308 Differential Equations | 3 |
| MATH 362 Algebraic Structures | 3 |
| MATH 412 Real Analysis | 3 |
| PHIL 101 Problems in Philosophy (3) or PHIL 102 History of Philosophy (3) | 3 |
| PHYS 211 General Physics I | 4 |
| PHYS 212 General Physics II | 4 |
| PHYS 251 Modern Physics | 4 |
| PHYS 328 Classical Mechanics | 3 |
| PHYS 402 Quantum Mechanics | 3 |
| STAT 291 Probability and Statistics | 3 |
| STAT 292 Inferential Statistics (3) | 3 |
| ENGR 371 Thermodynamics (3) or CHEM 437 Physical Chemistry I (3) | 3-3.5 |
| MATH 496 Mathematic Capstone* (3) or PHYS 494 Senior Physics Seminar (3) | 2-3 |
| <i>Nine (9) credits from the following:</i> MATH 301 Numerical Analysis (3) MATH 341 Mathematical Modeling (3) MATH 382 Geometry (3) MATH 392 History of Mathematics (3) MATH 405 Introduction to Mathematical Research (3) MATH 490 Topics in Mathematics (3) MATH 491 Independent Study (3) ENGR 365 Linear Systems (3) STAT 3xx/4xx (3) | 9 |

| Experiential Learning requirement | |
|--|------------------|
| QuEST requirements | |
| First Year Seminar | 3 |
| Oral Communication | 3 |
| Created and Called for Community (W) | 3 |
| Mathematical Sciences (MATH 111) | met/major |
| Laboratory Science (PHYS 211) | met/major |
| Science, Technology & the World | waived |
| Social Science (ECON 120) (met/major if Math primary) | 0-3 |
| European History or United States History | 3 |
| Literature | 3 |
| Philosophy and Religion (PHIL 101 or 102) met/major if PHYS primary | 0-3 |
| Arts | 3 |
| First Semester of Language | 3 |
| Second Semester of Language | 3 |
| Third Semester of Language/Cross Cultural | 3 |
| Non-Western Studies | 2 or 3 |
| Bible | 3 |
| Christian Beliefs | 3 |
| Wellness | 1 |
| Ethics, World Views or Pluralism | waived |
| QuEST requirements | 42-43 |
| | |
| Major requirements (32-33 credits overlap) | 85-87.5 |
| Free Elective | 2-0 |
| Total | 123-130.5 |

(Not a formal major; this sheet clarifies the policy for double majoring in Mathematics and Physics.)

Cybersecurity minor

(18 credits)

CIS 160 Intro to CS and Cybersecurity (3)

CIS 255 NIX System Administration and Security (3)

CIS 332 Database Concepts (3)

CIS 357 Info Assurance and Risk Management (3)

CIS 373 Cloud Computing (3)

Three credits from the following:

CIS 325 Data Communications and Networking (3)

CIS 355 Network Security (3)

CIS 474 Digital Forensics (3)

Data Science minor

(21 credits)

CIS 181 Computer Programming I (3)

CIS 284 Computer Programming II (3)

CIS 332 Database Concepts (3)

DASC 2xx Intro to Data Science (3)

STAT 291 Probability and Statistics (3)

STAT 292 Inferential Statistics (3)

DASC/STAT 3xx/4xx Upper level Elective (3)

*These courses require prerequisite(s), which may increase the total credits required for the minor.

Computer Science minor

(18 or 20 credits) COSC

CIS 160 Intro to CS and Cybersecurity (3)

CIS 284 Computer Programming II (3)

CIS 285 Data Structures (3)

One of the following options:

a. CIS 181 Computer Programming (3) **and** 6-7 credits from the following:

CIS 255 NIX System Admin and Security (3)

CIS 281 Programming for User Interaction (3)

CIS 287 Introduction to Game Design (3)

CIS 315 Intro to Mobile Application & Game Design (3)*

CIS 325 Data Communications and Networking (3)

CIS 332 Database Concepts (3)

CIS 335 Software Engineering (3)*

CIS 355 Network security (3)*

CIS 384 Elements of Computing Systems (3)

CIS 387 Analysis of Algorithms (3)

CIS 416 Operating Systems and Computer Architecture (3)*

CIS 418 Machine Learning (3)

CIS 487 Interactive 3D Graphics (3)

ENGR 363 Embedded System Design (4)*

b. ENGR 212 Programming for Engineers (2) **and** 7-9 credits from the following (7-9):

CIS 255 NIX System Admin and Security (3)

CIS 281 Programming for User Interaction (3)

CIS 287 Introduction to Game Design (3)

CIS 315 Intro to Mobile Application & Game Design (3)*

CIS 325 Data Communications and Networking (3)

CIS 332 Database Concepts (3)

CIS 335 Software Engineering (3)*

CIS 355 Network security (3)*

CIS 384 Elements of Computing Systems (3)

CIS 387 Analysis of Algorithms (3)

CIS 416 Operating Systems and Computer Architecture (3)*

CIS 418 Machine Learning (3)

CIS 487 Interactive 3D Graphics (3)

ENGR 363 Embedded System Design (4)*

*These courses require prerequisite(s), which may increase the total credits required for the minor.

Mathematics minor

(20-21 credits) MATH

MATH 111 Calculus I (4)

MATH 112 Calculus II (4)

Twelve additional credits from the following (12-13):

MATH 211 Calculus III (4)

MATH 261 Linear Algebra (3)

MATH 270 Linear and Differential Methods (3) (see note)

or MATH 308 Differential Equations (3) (see note)

STAT 291 Probability and Statistics (3)

STAT 292 Inferential Statistics (3)

ENGR 365 Linear Systems (3)

MATH/STAT 3xx/4xx**

NOTE: MATH 307, 391, 407 do not count towards the minor. Either MATH 270 or MATH 308 will count towards the requirements, but not both.

*This course requires prerequisite(s), which may increase the total credits required for the minor.

**Courses within this range may require prerequisites, which may increase the total credits for the minor.

Physics minor

(21-21.5 credits) PHYS

PHYS 211 General Physics I (4)

PHYS 212 General Physics II (4)

PHYS 251 Modern Physics (4)

Three of the following courses (9 credits total):

ENGR 367 Electromagnetics (3)*

ENGR 371 Thermodynamics (3)

or CHEM 437 Physical Chemistry I (3.5)

PHYS 317 Optics (3)

PHYS 328 Classical Mechanics (3)*

PHYS 402 Quantum Mechanics (3)

PHYS 421 Particle Physics (3)*

PHYS 425 Solid State Physics (3)*

Note: Students interested in the physics minor should be aware that 12-15 credits of mathematics courses, (or transfer/AP equivalents), are prerequisite to courses in the physics minor. These courses are MATH 111, MATH 112, one of (MATH 210, MATH 211), and MATH 270.

*This course requires prerequisite(s), which may increase the total credits required for the minor.

Statistics minor

(18 credits) STAT

Three credits from the following:

STAT 269 Introductory Statistics (3)

STAT 281 Applied Statistics for Management (3)

STAT 291 Probability and Statistics (3)

STAT 292 Inferential Statistics (3)

Twelve additional credits of STAT 3xx/4xx courses* (12)

*This course requires prerequisite(s), which may increase the total credits required for the minor.

Web Development minor

(18-24 credits) WDEV

CIS 191 Web Development: Client Side (3)

CIS 291 Web Development: Server Side (3)

CIS 343 E-Commerce (3)

Three credits from the following:

CIS 255 NIX System Admin and Security (3)*

CIS 332 Database Concepts (3)

CIS 415 Data Communications and Networking (3)

Six credits from the following:

ARTH 205 Design History and Theory (3)

BUSA 120 Principles of Management (3)

CIS 180 Introduction to Computer and Information Science

CIS 381 Information Systems and Managers (3)*

COMM 207 Communication Design (3)

COMM 337 Multimedia Storytelling (3)

COMM 382 History and Theory of Digital Media (3)

MRKT 130 Marketing Principles (3)

*This course requires prerequisite(s), which may increase the total credits required for the minor