## B.S. IN MATHEMATICS - MATHEMATICS CONCENTRATION

College of the Sciences and Mathematics
Curriculum

| Code Title | Credits |
| :--- | ---: |
| GENERAL EDUCATION REQUIREMENTS (http:// |  |
| catalog.wcupa.edu/undergraduate/general-education- |  |
| requirements/) |  |
| Academic Foundations | 4 |
| First Year Experience requirement | $6-7$ |
| English Composition requirement | $3-4$ |
| Mathematics requirement | 3 |
| Interdisciplinary requirement | 3 |
| Diverse Communities requirement | 3 |
| Ethics requirement | $6-8$ |
| Distributed Disciplinary Foundations | 6 |
| Science requirement | 6 |
| Behavioral \& Social Science requirement | 3 |
| Humanities requirement |  |
| Arts requirement |  |

$\left.\begin{array}{lr}\text { ADDITIONAL BACCALAUREATE } & \\ \text { REQUIREMENTS (http://catalog.wcupa.edu/ } \\ \text { undergraduate/general-education-requirements/) }\end{array}\right)$

| MAJOR REQUIREMENTS |  |  |
| :--- | :--- | ---: |
| Major Courses |  | 4 |
| MAT 161 | Calculus I | 4 |
| MAT 162 | Calculus II | 3 |
| MAT 200 | The Nature of Mathematics | 4 |
| MAT 261 | Calculus III | 3 |
| MAT 311 | Linear Algebra | 3 |
| MAT 343 | Differential Equations | 3 |
| MAT 411 | Algebra I | 3 |
| MAT 421 | Mathematical Statistics I | 3 |
| MAT 441 | Real Analysis I | 3 |
| MAT 445 | Complex Variables | 18 |
| Mathematics Electives |  |  |
| Select 18 credit hours from upper-division (300-level or  <br> higher) mathematics courses; at least one course from each  <br> of the areas below.  <br> Algebra elective  <br> MAT 321 Combinatorics and Graph Theory <br> MAT 412 Algebra II <br> MAT 414 Theory of Numbers <br> MAT 415 Introduction to Cryptography <br> Analysis elective  <br> MAT 432 Topology <br> MAT 442 Real Analysis II <br> MAT 443 Applied Analysis I |  |  |
| MAT 444 | Applied Analysis II |  |


| Applied mathematics elective |  |  |
| :---: | :---: | :---: |
| MAT 325 | Numerical Analysis I |  |
| MAT 371 | Mathematics of Finance |  |
| MAT 413 | Computer Algebra |  |
| MAT 415 | Introduction to Cryptography |  |
| MAT 422 | Mathematical Statistics II |  |
| MAT 423 | Applied Probability |  |
| MAT 425 | Numerical Analysis II |  |
| MAT 427 | Introduction to Optimization Techniques |  |
| MAT 433 | Mathematical Modeling |  |
| MAT 478 | Fundamentals of Actuarial Science |  |
| MAT 479 | Financial Calculus |  |
| STA 319 | Applied Statistics |  |
| Related/Cognate Requirements |  |  |
| CSC 141 | Computer Science I ${ }^{1}$ | 3 |
| ENG 371 | Technical Writing ${ }^{1}$ | 3 |
| PHY 170 | Physics I ${ }^{1}$ | 4 |
| PHY 180 | Physics II | 4 |
| SPK 230 | Business and Professional Speech Communication ${ }^{1}$ | 3 |
| Capstone Requirement |  |  |
| MAT 480 | Capstone in Mathematics ${ }^{3}$ | 3 |
| Free Electives or Independent Study |  |  |
| Select 15 hou (chosen under | dependent study and free electives ment) | 15 |
| Total Minimu | dits Required | 120 |

## Accelerated B.S. in Mathematics - Mathematics Concentration to M.A. in Mathematics Program

Students may substitute up to 5 graduate courses for B.S. course requirements, subject to the following guidelines:

| Code | Title | Credits |
| :---: | :---: | :---: |
| Major Requirements |  |  |
| MAT 445 | Complex Variables | 3 |
| or MAT 575 | Complex Analysis I |  |
| Algebra Elective |  |  |
| May be replaced by one of the following: |  |  |
| MAT 513 | Linear Algebra |  |
| MAT 514 | Theory of Numbers |  |
| MAT 515 | Algebra I |  |
| MAT 516 | Algebra II |  |

Analysis Elective
May be replaced by one of the following:

| MAT 535 | Topology |
| :--- | :--- |
| MAT 543 | Topics in Differential Equations |
| MAT 545 | Real Analysis I |
| MAT 546 | Real Analysis II |

Applied Mathematics Elective
May be replaced by one of the following:

| STA 505 | Mathematical Statistics I ${ }^{2}$ |
| :--- | :--- |
| MAT 548 | Industrial Mathematics - Continuous |
|  | Models |
| MAT 549 | Industrial Mathematics - Discrete <br>  <br> MAT 552 |
| Models |  |
| Operations Research |  |
| MAT 553 554 | Stochastic Modeling |
| MAT 5cientific Computing |  |

MAT $555 \quad \begin{aligned} & \text { Industrial Practicum - Continuous } \\ & \text { Models }\end{aligned}$
Mathematics Electives
May be replaced by any course from the three areas above or any of the following:

| MAT 521 | Discrete Mathematics \& Graph <br> Theory |
| :--- | :--- |
| MAT 532 | Geometry I |
| MAT 533 | Geometry II |
| MAT 595 | Topics in Mathematics |

## Free Electives or Independent Study

May be replaced by any course from the four areas above or any other 500-level MAT, MTE, STA, or CSC course.
${ }^{1}$ Indicates course satisfies a general education requirement.
${ }^{2}$ Or higher level STA course
${ }^{3}$ This course fulfills the Capstone requirement and is also a Writing Emphasis and Speaking Emphasis course

All math major courses must be passed with a C or better.

## Sample Course Plan

To track their individual degree progress, students are advised to access their Degree Progress Report (DPR) via myWCU regularly. For more information, visit wcupa.edu/DegreeProgressReport (http://wcupa.edu/ degreeprogressreport/).
The following is a sample suggested course sequence for this program; course offerings and availability are not guaranteed. Students should consult their academic advisor with any questions.

| Course | Title | Credits |
| :---: | :---: | :---: |
| Year One |  |  |
| Fall |  |  |
| MAT 161 | Calculus I |  |
| CSC 141 | Computer Science I | 3 |
| WRT 120 <br> or WRT 123 | Effective Writing I or Effective Writing with Supplemental Writing Workshop | 3 |
| FYE 100X | First Year Experience |  |
| MAT 125 | Introduction to Statistics and Probability (recommended) | 3 |
|  | Credits | 17 |
| Spring |  |  |
| MAT 162 | Calculus II |  |
| MAT 200 | The Nature of Mathematics | 3 |
| PHY 170 | Physics I |  |
| Behavioral \& | Social Science Gen Ed | 3 |
| Humanities Gen Ed |  |  |
|  | Credits | 17 |
| Year Two |  |  |
| Fall |  |  |
| MAT 261 | Calculus III |  |
| MAT 311 | Linear Algebra | 3 |
| PHY 180 | Physics II |  |
| WRT 2XX | 200-Level WRT Course | 3 |
| Humanities Gen Ed |  |  |
|  | Credits | 17 |
| Spring |  |  |
| MAT 343 | Differential Equations | 3 |
| Mathematics | Elective ${ }^{3}$ |  |


| Ethics Gen Ed | 3 |
| :---: | :---: |
| Free Elective (S/W course MAT 401 recommended) ${ }^{2}$ | 3 |
| Free Elective ${ }^{2}$ | 3 |
| Credits | 15 |
| Year Three |  |
| Fall |  |
| MAT 411 Algebra I | 3 |
| MAT 421 Mathematical Statistics I | 3 |
| Mathematics Elective ${ }^{3}$ | 3 |
| Interdisciplinary Gen Ed | 3 |
| Arts Gen Ed | 3 |
| Credits | 15 |
| Spring |  |
| MAT 441 Real Analysis I | 3 |
| MAT 480 Capstone in Mathematics | 3 |
| SPK 230 |  |
| Algebra Elective | 3 |
| Diverse Communities Gen Ed | 3 |
| Credits | 12 |
| Year Four |  |
| Fall |  |
| MAT 445 Complex Variables | 3 |
| ENG 371 Technical Writing | 3 |
| Analysis Elective | 3 |
| Free Elective ${ }^{2}$ | 3 |
| Free Elective ${ }^{2}$ | 3 |
| Credits | 15 |
| Spring |  |
| Applied Mathematics Elective | 3 |
| Behavioral/Social Science Gen Ed | 3 |
| Mathematics Elective ${ }^{3}$ | 3 |
| Free Elective (MAT 499 recommended) 1,2 | 3 |
| Credits | 12 |
| Total Credits | 120 |

${ }^{1}$ MAT 499 may be taken for variable credit and repeated for credit.
${ }_{3}^{2}$ Must be approved by advisor.
${ }^{3}$ Any courses in mathematics with course numbers above 311, with the exception of those courses with a primary focus on teacher education or those courses restricted to students majoring in early or middle grades education.

