Bachelor of Science (BS) **2017-2018** **Program of Study for Mathematics Majors**
Degree Code 260*
Concentration Code 260E **COMPUTATION**

I. GENERAL EDUCATION CURRICULUM..... 44
Math 1110 will meet the Quantitative Literacy general education requirement.

II. MAJOR REQUIREMENTS *(not including 4 s.h. counted in Area I, above)* **..... 61**
2.0 major GPA is required for graduation. Major GPA calculation will include <u>all</u> courses taken in the major department, plus any other courses under II. Minimum of 18 semester hours of courses taken to fulfill major requirements must be courses offered by Appalachian.

A. Mathematics Common Core (15 hours)

MAT 1110	_____	(4)	Calculus with Analytic Geometry I *(Pre: MAT 1025 w/min grade C-)*
MAT 1120	_____	(4)	Calculus with Analytic Geometry II *(Pre: MAT 1110 w/min grade C-)*
MAT 2110	_____	(4)	Techniques of Proof *(Pre: MAT 1120)*
MAT 2240	_____	(3)	Introduction to Linear Algebra *(Pre: MAT 1120)*

HONORS STUDENTS
You may substitute MAT 2510 Sophomore Honors Seminar for MAT 2110, and MAT 4510 Senior Honors Thesis for your Capstone. This will slightly change your elective requirements to ensure you earn 65 hours in Area II. Please see your advisor for approval and more information.

B. Mathematics Courses for the Concentration (13 hours)

MAT 2310	_____	(3)	Computational Mathematics *(Pre: MAT 1120)*
MAT 4310	_____	(3)	Numerical Methods *(Pre: MAT 2310, 2240; rec: MAT 2130 or 3130)*
STT 3850	_____	(4)	Statistical Data Analysis I *(Pre: MAT 1110)*

<u>Choose one:</u>

MAT 3110	_____	(3)	Introduction to Modern Algebra **[WID]** *(Pre: RC 2001, MAT 2110 or 2510; Co: 2240)*
MAT 3220	_____	(3)	Intro to Real Analysis I **[WID]** *(Pre: RC 2001, MAT 2110 or 2510)*

C. Capstone Requirements (4 hours) Choose one option:
OPTION 1: 4 hours
MAT 4311 _____ (1) Capstone: Numerical Methods **[CAP]** *(Co: MAT 4310)*
MAT 4000-level course_____ (3) _____

OPTION 2: Choose one 4-hour combination (courses taken in the same semester); [CAP] is Capstone course; Each has *Co:* of first course in each pair below

MAT 4010___ (1-3) Current Topics in Mathematics	**AND**	MAT 4011 ___ (1) Current Topics in Math **[CAP]**
MAT 4140___ (3) Differential Geometry *(Pre: MAT 2130; Co: MAT 2240)*	**AND**	MAT 4141 ___ (1) Differential Geometry **[CAP]**
MAT 4220___ (3) Intro to Real Analysis II *(Pre: MAT 3220)*	**AND**	MAT 4221 ___ (1) Intro to Real Analysis II **[CAP]**
MAT 4340___ (3) Intro to Operations Research (*Pre: MAT 2240, STT 3850; Sr st)*	**AND**	MAT 4341 ___ (1) Intro to Oper Research **[CAP]**
MAT 4420___ (3) Dynamical Systems Theory (*Pre: MAT 3130 or 3310)*	**AND**	MAT 4421 ___ (1) Dynamical Systems Theory **[CAP]**
MAT 4590___ (3) Adv Topics in Differential Equations *(Pre: MAT 3130; Sr st)*	**AND**	MAT 4591 ___(1) Adv Topics in Diff Equations **[CAP]**
MAT 4710___ (3) Intro to Topology *(Pre: MAT 3220; St st)*	**AND**	MAT 4711 ___ (1) Introduction to Topology **[CAP]**
MAT 4720___ (3) Abstract Algebra *(Pre: MAT 3110; Sr st)*	**AND**	MAT 4721 ___ (1) Abstract Algebra **[CAP]**
MAT 4990___ (3) Numerical Linear Algebra *(Pre: MAT 4310; Sr. st)*	**AND**	MAT 4991 ___ (1) Numerical Linear Algebra **[CAP]**
STT 4820___ (3) Design & Analysis of Experiments *(Pre: STT 3820; Sr st)*	**AND**	STT 4821 ___ (1) Design & Analysis of Exper **[CAP]**
STT 4830 ___(3) Linear Regression Models *(Pre: MAT 2240; STT 3830; Sr. st)*	**AND**	STT 4831 ___ (1) Linear Regression Models **[CAP**]
STT 4840 ___ (3) Regression & Time Series Forec *(Pre: MAT 2240; STT 3250, 3850)*	**AND**	STT 4841 ___ (1) Regression &Time Series Forec **CAP]**

D. Approved Electives: 10 hours in mathematical sciences** **to bring total number of hours in AREA II to 65**
(At least 3 hours in MAT if STT combination was chosen in Area C. Capstone)

_____

E. Computational Concentration (14 hours)

C S 1440	_____	(4)	Computer Science I *(Pre: MAT 1020 or 1025 w/min grade C-)*
C S 2440	_____	(4)	Computer Science II *(Pre: CS 1440 or 1445 w/min grade C; Co: CS 1100)*
C S 3430	_____	(3)	Database *(Pre: CS 2440 with min grade of C)*
C S 3460	_____	(3)	Data Structures *(Pre: CS 2440 with min grade of C)*

F. Electives: 9 hours** of Approved courses in the sciences, which may include computer science_____
** *Must be approved by mathematical sciences advisor*.

III. MINOR (optional)

IV. ELECTIVES (taken to total 122 hours for the degree) ..... <u>17</u>
2 semester hours of free electives must be outside the major discipline. **122**