

**Recommended Academic Plan for Bachelor of Science Mathematics, Graduate Study Option
(MTHBD at Penn State Erie) – Effective Spring 2009.**

Semester 1	Credits	Semester 2	Credits
<i>MATH 140(GQ) Calculus with Analytic Geometry I</i>	4	<i>MATH 141(GQ) Calculus with Analytic Geometry II</i>	4
ENGL 15 or 30 (GWS)	3	<i>MATH 220 (GQ) Matrices</i>	2
NATURAL SCIENCE (GN)	4	NATURAL SCIENCE (GN)	4
<i>CSE 121 (GQ) Introduction to Programming Techniques</i>	3	CSE 122 Intermediate Programming Techniques	3
First-Year Seminar	1	ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3
Total Credits:	15	Total Credits:	16
Semester 3	Credits	Semester 4	Credits
CAS 100 A, B, or C (GWS) Effective Speech	3	MATH 311W Concepts of Discrete Mathematics	4
MATH 230 Calculus and Vector Analysis	4	MATH 251 Ordinary and Partial Differential Equations	4
STAT 301-Statistical Analysis I	3	STAT 401-Experimental Methods	3
Health and Physical Activity (GHA)	1.5	ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3
ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3	Health and Physical Activity (GHA)	1.5
Total Credits:	14.5	Total Credits:	15.5
Semester 5	Credits	Semester 6	Credits
MATH 312 Concepts of Real Analysis	3	MATH or STAT course from group (1)	3
MATH or STAT course from group (1)	3	MATH or STAT course from group (1)	3
MATH or STAT course from group (1)	3	MATH Course from group (2)	3
NATURAL SCIENCE (GN)	3	ENGL 202C (GWS) Effective Writing: Technical	3
Select 3 credits of supporting courses from the School approved list.	3	ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3
Total Credits:	15	Total Credits:	15
Semester 7	Credits	Semester 8	Credits
MATH or STAT course from group (1)	3	MATH or STAT course from group (1)	3
MATH Course from group (2)	3	MATH course from group (2)	3
ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3	ARTS (GA), HUMANITIES (GH) or SOCIAL SCIENCE (GS)	3
Select 3 credits of supporting courses from	3	Select 3 credits of supporting courses from	3

the School approved list.		the School approved list.	
Elective course	3	Elective course	3
Total Credits:	15	Total Credits:	15

- **Bold type** indicates courses requiring a quality grade of C or better.
- *Italics* indicate courses that satisfy both major and General Education requirements.
- ***Bold Italics*** indicate courses requiring a quality grade of C or better and that satisfy both major and General Education requirements.
- GWS, GHA, GQ, GN, GA, GH, and GS are codes used to identify General Education requirements.
- US, IL, and US;IL are codes used to designate courses that satisfy University United States/International Cultures requirements.
- W is the code used to designate courses that satisfy University Writing Across the Curriculum requirement.

Scheduling patterns:

- Some courses are offered only in the fall or in the spring semester, and some upper-level courses are offered in alternate year pattern. Consult the advisor for suggestions on scheduling them.

Notes:

- In order to be eligible for entrance to the mathematics major, a student must have attained at least a 2.00 cumulative GPA and completed MATH 140 and 141 earning a grade of C or better in both courses.
- Students graduating from this major must achieve a minimum grade-point average of 2.00 and earn a grade of C or better in all 300- and 400-level courses within the Prescribed, Additional, and Supporting courses as specified in Senate Policy 82-44. If a student receives a grade below C, s/he must repeat that course or a School approved alternative, and earn a grade of C or better.
- Students should learn if they can apply their area of application courses towards a minor in that area.
- Courses with a US/IL designation may also be used to satisfy a GA/GH/GS/GN requirement. A course with a US and IL designation may not be used to satisfy both US and IL courses.
- A student needs at least one course with the US designation and one course with the IL designation.
- A student must earn at least a total of 120 credits for graduation.

Group (1): MATH 310, 412, 421, 427, 429, 435, 436, 441, 455, 456, 465, STAT 414, 461, 462.

Group (2): MATH 403, 421, 429, 435.