

# MATHEMATICS, B.S.

## MATHEMATICS OPTION (MA)

(Fall 2017-Summer 2018)

**MATHEMATICS BS CORE COURSES** (29 credits) \*Note: grades of C- or better required; only one D grade allowed in core or option/2.0 GPA

- \_\_\_\_\_ 4 MA 16500 Analytic Geometry & Calculus I
- \_\_\_\_\_ 4 MA 16600 Analytic Geometry & Calculus II
- \_\_\_\_\_ 3 MA 17500 Intro Discrete Math or MA 27500 Intermediate Discrete Math
- \_\_\_\_\_ 4 MA 26100 Multivariate Calculus
- \_\_\_\_\_ 3 MA 35100 Elementary Linear Algebra
- \_\_\_\_\_ Approved Science Courses (**3** courses):
 

_____ 4 Credits _____	(AST A100, ASTR 26400, 36400, 37000, 40100, or
_____ 4 Credits _____	BIOL 10000, 10800, 10900, 11700, 11900, 12600, 12700, 14000, 18300, or
_____ 3 Credits _____	BIOL 18400, 19500 or BIOL 20000—50000), or
	CHM 10200, 11500, 11600, 18300, 18400, 21800, or
	GEOG G107, G109, G237, G315, or
	GEOL G100, G103, G104, G108, G113, G121 or GEOL 20000—50000), or
	PHYS 12700, 15200 or PHYS 20000—50000)
- \_\_\_\_\_ **\*\*Lab Check (2 required):**

_____ Lab 1 _____	(**Note: science labs may overlap with approved science classes)
_____ Lab 2 _____	(BIOL 10001, 10800, 10900, 11700, 11900, 20300, 20400, 21500, 21600, or
	CHM 11500, 11600, or GEOL G103, G104, L100, or
	PHYS 15200, 20100, 21800, 21900, 22000, 22100 or 25100)

**MATHEMATICS OPTION COURSES** (25 credits) \*Note: grades of C- or better required; only one D grade allowed in core or option/2.0 GPA

- \_\_\_\_\_ 4 CS 16000 Introduction to Comp Science I
- \_\_\_\_\_ 3 MA 30500 Foundations of Higher Mathematics
- \_\_\_\_\_ 3 MA 36300 Differential Equations
- \_\_\_\_\_ 3 MA 44100 Real Analysis
- \_\_\_\_\_ 3 MA 45300 Elements of Algebra/Algebra I
- \_\_\_\_\_ 3 STAT 51100 Statistical Methods or STAT 51600 Basic Probability and Applications
- \_\_\_\_\_ 6 Credits Math/Statistics Additional Courses:
 

_____ 3 MA _____ or STAT _____	(MA 30000:59900 or STAT 49000:59900 or CS 38400, 48600, 48800,
_____ 3 MA _____ or STAT _____	or CS 54300 or 57200 — <b>*except MA 35100</b> )

**A&S BS LIBERAL ARTS REQUIREMENTS** (14 credits — credits may vary with double counting/language placement — see advisor)

- \_\_\_\_\_ 3 Second Semester Writing (C- or higher) (ENG W140 or ENG W233)
- \_\_\_\_\_ 3 Speaking Requirement (C- or higher) (COM 11400 or HIST H125)
- \_\_\_\_\_ 8 Credits Language Sequence (credit/placement required for 2 semesters of foreign language)
 

_____ (1 <sup>st</sup> )	_____ (2 <sup>nd</sup> )	one course at second semester level required
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 Options: (Arabic, French, German, Japanese, Latin, Spanish)

**GENERAL EDUCATION REQUIREMENTS** (33 Credits) \*Note: grades of C- or higher required in Gen Ed/2.0 GPA

**\*\*Up to 6 credits in Gen Ed GA1 to GB7 and 3 credits GCAP (C8) may originate in major discipline—see advisor for more information.**

- \_\_\_\_\_ 3 GA1 Category A1 -- Written Communication (See Bulletin or myBLUEprint for **General Education** courses)
- \_\_\_\_\_ 3 GA2 Category A2 -- Speaking and Listening
- \_\_\_\_\_ 3 GA3 Category A3 -- Quantitative Reasoning (\*\*MA 16500)
- \_\_\_\_\_ 3 GB4 Category B4 -- Scientific Ways of Knowing (\*\*see Mathematics Core/science requirements)
- \_\_\_\_\_ 3 GB5 Category B5 -- Social & Behavioral Ways of Knowing
- \_\_\_\_\_ 3 GB6 Category B6 -- Humanistic and Artistic Ways of Knowing
- \_\_\_\_\_ 3 GB7/71 Category B7 or B71 -- Interdisciplinary or Creative Ways of Knowing (\*\*FL11 and FL12 options)
- \_\_\_\_\_ 9 Additional Credits -- Category A or B General Education courses
 

_____ (FL11/FL112)	_____ (ENG W233)	_____ (2 <sup>nd</sup> Science)
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- \_\_\_\_\_ 3 **GCAP Category C8--Capstone Experience** (IPFW course only)

**MINOR/ELECTIVES** (to reach 120 credits):

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IPFW Residency Requirements: \_\_\_\_\_ 32 credits at 200 level or above at IPFW \_\_\_\_\_ with 15 of 32 credits at 300-400 in major  
 B.S. Requirements: \_\_\_\_\_ 120 credits \_\_\_\_\_ 30 credits 300-400 level \_\_\_\_\_ 2.0 GPA Degree/Major \_\_\_\_\_ C- or above in Major/Gen Ed courses

# MATHEMATICS, B.S.

## PLAN—MATHEMATICS OPTION (MA)

(Fall 2017-Summer 2018)

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 165000 (GA3)	Anlytc Geometry & Calc 1	MA 159 or 154 (C- or above); or placement	4	MA 16600	Anlytc Geometry & Calc II	MA 165 (C- or above)	4
ENG W131 (GA1)	Reading, Writing, & Inquiry	Self-Place or ENG W129 (C- or above)	3	GB5	Gen Ed Social/Behavior		3
GB4 (**see Mathematics Core requirements)	Gen Ed Science/Lab (Approved course)	*See lab requirement	4	Science/with Lab (Gen Ed A/B options)	Approved Science/Lab	*See lab requirement	4
FL 1 <sup>st</sup> semester (**GB7 options)	Foreign Language 1		4	FL 2nd (**GB7 or Gen Ed A/B options)	Foreign Language 2	FL 1/ placement	4
<b>Total Semester Credit Hours</b>			<b>15</b>	<b>Total Semester Credit Hours</b>			<b>15</b>

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 26100	Multivar Calc	MA 16600, (C- or above)	4	MA 35100	Elem Linear Algebra	2 sem calc (C- or above grades)	3
MA 17500 or MA 27500	Intro Discrete Math or Intermed Discrete Math	√	3	CS 16000	Intro to Comp Science I	MA 153 (CS 112 for students w/o prog experience)	4
COM 11400 or HIST H125 (GA2/A&S)	Fundament of Speech or Great Debates		3	GB7/71 (if needed)	Gen Ed Creative or Interdisciplinary		3
ENG W233 (Gen Ed A/B)	Intermed Expos Writing	ENG W131 (C- or above)	3	@ @ (Elective)	Free Elective		3
GB6	Gen Ed Hum/Artistic		3	Science (no lab) (Gen Ed A/B options)	Approved Science		3
<b>Total Semester Credit Hours</b>			<b>16</b>	<b>Total Semester Credit Hours</b>			<b>16</b>

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 36300	Differential Equations	MA 261 or 263; P or C: MA 351 (C- or above grades required)	3	MA 30500	Found of Higher Math	MA 166 & MA 175 (C- or above grades required)	3
STAT 51100 or STAT 51600	Statistical Methods or Basic Probability Appl	√	3	Math Elective	Approved Math elective	√	3
Elective	Free elective		3	@ @ (Elective)	Free elective		3
GCAP (C8)	Gen Ed Capstone	√	3	@ @ (Elective)	Free elective		3
@ @ (Elective) or Gen Ed A or B	Free elective course or Gen Ed A or B (if needed)		3	@ @ (Elective) or Gen Ed A or B	Free elective course or Gen Ed A or B (if needed)		3
<b>Total Semester Credit Hours</b>			<b>15</b>	<b>Total Semester Credit Hours</b>			<b>15</b>

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 45300	Elements of Algebra/ Algebra 1	MA 305 and MA 351 (C- or above grades required)	3	MA 44100	Real Analysis	MA 305 (C- or above grade)	3
Math Elective	Approved Math Elective	√	3	MA 49000 or @ @ @ (Elective)	VT-Topics MA/Undgrad or Free Elective	√	1
@ @ (Elective)	Free elective		3	@ @ (Elective)	Free elective		3
@ @ (Elective)	Free elective		3	@ @ (Elective)	Free elective		3
@ @ (Elective) or Gen Ed A or B	Free elective course or Gen Ed A or B (if needed)		3	@ @ (Elective)	Free elective		3
<b>Total Semester Credit Hours</b>			<b>15</b>	<b>Total Semester Credit Hours</b>			<b>13</b>

√ = See IPFW Bulletin or myBLUEprint for additional course prerequisites

**Summer Courses:**

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**120 credits required for Bachelor of Science degree**  
**2.0 GPA required for Bachelor of Science degree/major**