

Mathematics B.S. Degree - Computational Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – COP 2500 or CS Placement Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
Science Part I (BSC/PHY/CHM)	Note: CHM requires the Chem. Placement Test.
Science Part II (BSC/PHY/CHM)	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

Computational Track (36 credits)

Course Requirements

Requirement I: Take all of the following

COP 3503C (Computer Science II)	PR: 3502C, COP 3330 and MAD2104 or COT 3100C
MAP 4303 (Differential Equations II)	PR: MAP 2302 and MAS 3105
MAP 4341 (Intro to Partial Diff.Eq.)	PR: MAP 2302 and MAS 3105. Offered: Fall.
MAP 4371 (Numerical Methods for Diff.Eq.)	PR: MAC 2313, MAP 2302, COP 3223C, and MAS 3105 and MAP 4341. Offered: Spring.
MAP 4384 (Numer. Methods for Comp. Sciences)	PR: MAP 2302, COP 3223 and MAS 3105 or MAS 3106. Offered: Fall.
STA 2023 (Statistical Methods I)	PR: MGF 1106 or any MAC course
STA 4321 (Statistical Theory I)	PR: STA 2023 or STA 3032; CR: MAC 2313

Requirement II: Select 3 credit hours from 4000 or 5000 level courses with an **MAA, MAD, MAS** or **MTG** prefix offered by the Math Department

Requirement III: Select an additional **3 credit hours** from 4000 or 5000 level courses offered by the Math Department

Requirement IV: Select **9 credit hours** from the following

COP 3402 (Systems Software)	PR: CDA 3103C and COP 3502C
COP 4020 (Programming Languages I)	PR: COP 3503C and COT 3960
COT 4210 (Discrete Structures II)	PR: COP 3503C and COT 3960
COP 4331C (Processes for Obj.-Orient. SW Develop.)	PR: COP 3503C and COT 3960
COP 4600 (Operating Systems)	PR: COP 3503C and COP 3402
EEL 4768 (Computer Architecture)	PR: EEL 3801C or CDA 3103C

Note: COT 3960 (CS Foundation Exam) is only required of CS students. Computational math students can receive an override from the CS undergraduate advisor into the courses that have this prerequisite, as long as they have completed COP 3503C.

Note: Alternate courses can be chosen upon Departmental approval.

Further Graduation Requirements: Exit Interview / Exit Exam. You will be contacted by an advisor after you submit your Intent To Graduate petition.

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B.S. Mathematics Degree - Mathematical Economics Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – CS Placem. Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
Science Part I (BSC/PHY/CHM)	Note: CHM requires the Chem. Placem. Test.
Science Part II (BSC/PHY/CHM)	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

Mathematical Economics Track

Track Prerequisites

ECO 2023 (Principles of Microeconomics) (Complete as a part of the GEP courses)
QMB 3003 (Quantitative Business Tools I)
QMB 3200 (Quantitative Business Tools II)

Requirements (36 credit hours)

Requirement I: Take all of the following (27 credit hours)

ECO 2013 (Principles of Macroeconomics)	PR: None
ECO 3101 (Intermediate Microeconomics)	PR: ECO 2013, ECO 2023 and QMB 3003
ECO 3203 (Intermediate Macroeconomics)	PR: ECO 2013, ECO 2023 and QMB 3003
ECO 3410 (Mathematical Economics)	PR: ECO 3101
ECO 4412 (Econometrics I)	PR: ECO 2013, ECO 2023 and QMB 3200.
MAP 4113 (Probability, Random Proc. And Appl.)	PR: MAC 2313
MAP 4640 (Financial Mathematics)	PR: MAP 4113. Offered: Fall.
STA 2023 (Statistical Methods I)	PR: MGF 1106 and any other MAC courses
STA 4321 (Statistical Theory I)	CR: MAC 2313, PR: STA 2023 or STA 3032. Offered: Fall.

Requirement II: 3 credit hours from any 4000 or 5000 level courses with an **MAA, MAD, MAS** or **MTG** prefix offered by the Mathematics Department

Note: Additional courses can be taken as approved.

Requirement III: Select **6 credit hours** from the following

ECO 3703 (International Microeconomics)	PR: ECO 3101. Offered: Fall.
ECO 4504 (Public Economics)	PR: ECO 3101
ECO 4713 (International Macroeconomics)	PR: ECO 3101 or ECO 3203 or ECO 3223. Offered: Spring.
ECP 4303 (Environm. and Natural Resource Econ.)	PR: ECO 3101
ECP 4403 (Industrial Organization)	PR: ECO 3101
STA 4322 (Statistical Theory II)	PR: STA 4321. Offered: Spring.

Note: Additional courses can be taken as approved.

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B.S. Mathematics Degree - Engineering/Physics Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – CS Placem.Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
PHY 2048	Note: this track must take Physics.
PHY 2049	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

Engineering/Physics Track (36 credit hours)

Requirement I: Take all the following

Course	Pre-Requisite(s)
MAA 4402 Intr. to Complex Variables	PR: MAP 2302 and MHF 3302. Offered: Spring.
MAP 4103 Math Modeling	PR: MAS 3105 or MAS 3106 and MAP 2302
MAP 4341 P. D. E.	PR: MAP 2302 and MAS 3105 or MAS 3106. Offered: Fall.
PHY 3101 General Physics Using Calculus III	PR: MAC 2313 and PHY 2049C or PHY 2054

Requirement II: Select one

EGN 3321 Engineering Analysis - Dynamics	PR: EGN 3310 & MAC 2313
MAP 4303 O.D.E. II	PR: MAP 2302 and MAS 3105
MAP 5435 Advanced Math for Engineers	PR: MAP 2302, and graduate status or senior standing or C.I. Offered: Summer.
PHZ 3113 Intro to Theoretical Methods of Physics	PR: MAP 2302

Requirement III: Select one

COT 4500 Numerical Calculus	PR: MAC 2312 and COP 3223
EGN 3211 Engineering Analysis and Computation	PR: MAC 2312
EGN 3420 Engineering Analysis	PR: EGN 3211 and MAC 2312. Occasional.
MAP 4371 Numerical Method for D. E.	PR: MAC 2313, MAP 2302, COP 3223C, MAS 3105. Offered: Spring.
MAP 4384 Numerical Method for Computer Science	PR: MAP 2302, COP 3223C, MAS 3105. Offered: Fall.
PHZ 3151 Computer Methods in Physics	PR: PHY 3101

Requirement IV: Select one

EGN 3310 Engineering Analysis - Statics	PR: MAC 2311C and PHY 2048
PHY 3220 Mechanics I	PR: PHY 2048C or PHY 2049H, MAP 2302

Requirement V: Select one

EGN 3343 Thermodynamics	PR: EGN 3310 & MAC 2313
PHY 3513 Thermal and Statistical Physics	PR: PHY 3101 or PHY 3101H

Requirement VI: Select 6 credit hours

CES 4100C Structural Analysis I and Lab	PR: EGN 3331C and CGN 3405
EAS 3101 Fundamentals of Aerodynamics	PR: EML 3701
EEL 3004C Electrical Networks	PR: MAC 2311C, MAC 2312, MAC 2313, PHY 2048C, PHY 2049C
EGM 3601 Solid Mechanics	PR: MAC 2311C, MAC 2312, MAC 2313, PHY 2048C, EGN 3310
EGN 3331C Mechanics of Materials	PR: EGN 3310; CR: MAP 2302
ESI 4312 Deterministic Methods for Operations Research	PR: STA 3032 and MAS 3105
PHY 4604 Wave Mechanics I	PR: PHZ 3113, PHY 3220
PHY 4605 Wave Mechanic II	PR: PHY 4604

Requirement VII: Select 6 credit hours

CWR 3201 Engineering Fluid Mechanics	PR: MAP 2302 and EGN 3310
EAS 4105 Flight Mechanics	PR: EAS 3101; C.R. EML 4225
EAS 4200 Analysis & Design of Aerospace Structures	PR: EGM 3601
EAS 4400 Spacecraft Attitude Dynamics	PR: EML 4225
EAS 4505 Orbital Mechanics	PR: EGN 3321, MAC 2313, MAP 2302 and PHY 2048
EEE 3342C Digital Systems	PR: MAC 2312, PHY 2048C and PHY 2049

EEL 3470 Electromagnetic Fields	PR: EEL 3004C
EEL 3552C Signal Analysis and Analog Communication	PR: EEL 3123C
EEL 3657 Linear Control Systems	PR: EEL 3123C
EEL 3801C Computer Organization	PR: EGN 3211 and EEE 3342C
EEL 4742C Embedded Systems	PR: EEL 3801C
EEL 4750 Digital Signal Processing Fundamentals	PR: EEL 3123C
EEL 4832 Engineering Applications of Computer Methods	PR: EEL 3123C and EGN 3211
EEL 4851C Engineering Data Structures	PR: EEL 3801C
EGN 3365 Structure and Properties of Materials	PR: MAC 2312 and (CHS 1440 or CHM 2045C)
EGN 3613 Engineering Economic Analysis	PR: MAC 2311C
EIN 4333 Production and Distribution Systems	PR: ESI 4312
EMA 4223 Fundamentals of Mechan. Behav. of Materials	PR: EGM 3601, and EGN 3365 or EMA 3706
EML 3262 Kinematics of Mechanisms	PR: MAC 2313, MAP 2302, PHY 2048C, EGN 3321
EML 3701 Fluid Mechanics I	PR: MAC 2313, MAP 2302, PHY 2048C, EGN 3321 and EGN 3343
EML 4142 Heat Transfer	PR: EML 3701 and EML 3034C
EML 4225 Introduction to Vibrations and Controls	PR: EGN 3321, EGM 3601, EML 3034C and EGN 3373
EML 4313 Intermediate System Dynamics and Controls	PR: MAP 2302, EGN 3321, EGN 3373, and EML 4225
EML 4703 Fluid Mechanics II	PR: EML 3701
ENV 4561 Adv. Envir. Engin. Operations & Processes	PR: ENV 4531
ESI 4234 Quality Engineering	PR: STA 3032
ESI 4523 Systems Simulation	PR: STA 3032
PHY 3323 Electricity and Magnetism I	PR: PHY 2049C and MAP 2302
PHY 4324 Electricity and Magnetism II	PR: PHY 3323
STA 4321 Statistical Theory I	PR: STA 2023 or STA 3032; C.P. MAC 2313
STA 4322 Statistical Theory II	PR: STA 4321

Requirements VIII: Select one

MAD 4203 Introduction to Combinatorics	PR: MAC 2312 and MHF 3302 or COT 3100C. Offered: Fall.
MAD 4301 Introduction to Graph Theory	PR: MHF 3302 or COT 3100C. Offered: Spring.

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B.S. Mathematics Degree - General Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – CS Placem.Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
Science Part I (BSC/PHY/CHM)	Note: CHM requires the Chem. Placem. Test.
Science Part II (BSC/PHY/CHM)	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

General Track (18 credit hours)

Requirement I: 3 credit hours from 4000-5000 level courses with an MAP or MAT prefix offered by the Math Dept.

Requirement II: 3 credit hours from 4000-5000 level courses with an MAA , MAD , MAS or MTG prefix offered by the Math Dept.

Requirement III: 12 credit hours from 4000-5000 level courses offered by the Math Dept.

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B.S. Mathematics Degree - Biology Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – CS Placem. Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
Sciences: See requirements below.	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

Mathematical Biology Track

Science Prerequisites: Take all of the following:

BSC 2010C (4)	
BSC 2011C (4)	
CHM 2045C (4) (or CHM 2040/2041)	Note: CHM requires the Chem. Placem. Test.
CHM 2046 (3)	
CHM 2046L (1)	

Requirement I: Take all of the following:

Course	Remarks:
CHM 2210 Organic Chemistry I	"C" or better in CHM 2046
CHM 2211 Organic Chemistry II	CHM 2210
MAP 4484 Mathematical Biology	MAP 2302, MAS 3105

Requirement II: 3 credit hours from any 4000-5000 level course with an **MAP** or **MAT** prefix offered by the Math Dept

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Requirement III: 3 credit hours from any 4000-5000 level course with an **MAA, MAD, MAS** or **MTG** prefix offered by the Math Dept

Requirement IV: Select 9 hours from courses listed in the restricted electives within the Biology and/or Biomedical Sciences programs (Please consult with the Biology/Biomed.Sc. advisors)

Requirement V: Select 9 hours Statistics courses offered by the Department of Statistics and Data Science, 6 credit hours of which must be at the upper division (3000-4999) level (Please consult with the Statistics and Data Science advisors)

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B.S. Mathematics Degree – Mathematical Data Analysis Track

Core: Basic Requirements

Course	Remarks:
Pre-Requisite(s)	As needed (e.g., MAC 1105, MAC 1114, MAC 1140...)
MAC 2311 (Calculus I)	
MAC 2312 (Calculus II)	
MAC 2313 (Calculus III)	
MAP 2302 (Ordinary Differential Eqns I)	PR: MAC 2313
COP 3223C or EGN 3211	PR: COP 3223 – CS Placem.Test, EGN 3211 - MAC 2312.
COP 3502C (Computer Science I)	PR: COP 3223C or EGN 3211, and MAC 1105C
Science Part I (BSC/PHY/CHM)	Note: CHM requires either the Chem. Placem. Test or an additional Chemistry course
Science Part II (BSC/PHY/CHM)	

Core: Advanced Requirements

Course	Remarks:
MHF 3302 (Logic and Proof in Mathematics)	CR: MAC 2312, PR: MAC 2311. Can be substituted with COT 3100C upon Dept approval.
MAS 3105 (Matrix and Linear Algebra)	CR: MAC 2313, PR: MAC 2312
MAS 3106 (Linear Algebra)	PR: MHF 3302 and MAS 3105
MAS 4301 (Abstract Algebra)	PR: MAS 3106
MAA 4226 (Advanced Calculus I)	PR: MAC 2313 and MAS 3106

Mathematical Data Analysis Track (30 credit hours)

Requirement I: Take ALL of the following:

Course	Remarks:
MAD 4203 (Introduction to Combinatorics)	Fall. PR: MAC 2312 and (MHF 3302 or COT 3100)
MAD 4301 (Introduction to Graph Theory)	Spring. PR: MHF 3302 or COT 3100
MAP 4112 (Mathematical Foundations of Machine Learning and Artificial Intelligence)	Fall. PR: MAC 2313 and MAS 3105
MAP 4113 (Probability)	Fall, Spring. PR: MAC 2313
MAP 4191 (Mathematical Modeling of Data)	Fall. PR: MAC 2313 and MAS 3105
MAP 4193 (Topological Data Analysis)	Spring. PR: MAC 2313 and MAS 3105

Requirement II: 6 credit hours in upper-division (3000-4999) courses offered by the Department of Statistics and Data Science

Requirement III: 6 credits hours in 4000-level courses in the Department of Computer Science

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