FAU
FLORIDA ATLANTIC UNIVERISTY

New Combined Degree Program Request

UUPC Approval _____

UGPC Approval _____

UFS Approval _____

Banner Posted _____

Catalog _____

New Combined Degree Program Request

Proposed Program: _BS in Mathematics with MS in AMST_ CIP: _____ Effective Date (Term/Year): _Fall_/_2020_ (e.g. Fall/2020)

Proposed Combined Program Information	Undergraduate	Graduate
Degree Level (e.g. B.A., B.S., M.A., M.S., etc.)	BS	MS
Program Name (e.g. Physics, Engineering, etc.)	Mathematics	Applied Mathematics and Statistics
College	Schmidt College of Science	Schmidt College of Science
Department	Mathematical Sciences	Mathematical Sciences
Program Description (provide a brief description of the program, including thesis or non-thesis option)	This is an accelerated five-year program where students complete the Bachelor of Science (BS) degree in Mathematics and then continue with a Master of Science (MS) degree in Applied Mathematics and Statistics (AMST). For the MS degree, both thesis and non-thesis options are available.	

Curriculum Requirements

GPA Requirements: Departments must establish a minimum undergraduate GPA for students to be admitted to a combined program. *Note: Please attach explanation.* GPA of 3.0 in upper-division and graduate courses	**List courses to be shared:** Up to twelve (12) credit hours of graduate courses (5000 level or above course work) may be shared between the graduate and undergraduate degree for a combined program. *Note: Please attach explanation:* • *Academic justification for shared credits and catalog language* • *List the undergraduate course that will be replaced by graduate courses.*

Faculty Submitting Request	Name	Signature	Email	Date
	Yuan Wang	*Yuan Wang*	ywang@fau.edu	2/24/2020

Approved by

Department Chair: _____

College Dean: _William David Kalie_____

College Curriculum Chair: _Christopher Beetle_ 2020.03.06 11:48:21 -05'00'

UUPC Chair: _____

Undergraduate Studies Dean: _____
(Note: Forward approved form to UGPC@fau.edu)

UGPC Chair: _____

UGC Chair: _____

Graduate College Dean: _____

UFS President: _____

Provost: _____

Date

Feb 25, 2020

March 9, 2020

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Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

For questions, contact the Graduate College at ugpc@fau.edu

Updated: 01/31/2020

Academic Justification

This is a proposal for creating a combined BS/MS degree with BS in Mathematics and MS in Applied Mathematics and Statistics. The joint program is expected to be completed in approximately five years. The combined degree program is 150 credits: 120 credits for the undergraduate degree and 30 for the master's degree, with a maximum of 12 credits of graduate coursework used to satisfy both degrees. The baccalaureate degree will be conferred before the master's degree.

Background information:

- The two degree programs are both offered currently.
- No additional resources are required.

Justification:

The combined program is expected to help retain the best and brightest of our own students, as well as recruit talented students to the BS program. There have been bright and ambitious undergraduate students, including FAU High students, who took graduate courses in mathematics while completing their bachelor's degree. The combined program will entice such students to complete the MS degree at FAU. Some students may also be persuaded to continue towards a doctoral education in a STEM field.

The applied nature of the MS program in Applied Mathematics and Statistics may enhance the opportunity for students to find jobs or internship positions in industry, thereby attracting students interested in real world applications of mathematics.

Admission requirements:

Students must maintain a GPA of 3.0 in upper-division and graduate courses. Students interested in this program should consult with the undergraduate and graduate advisors before taking upper-division mathematics coursework to ensure that their coursework will apply toward the combined degree. Students must take the GRE and apply for admission to candidacy by the end of their junior year.

Courses to be shared by the BS and MS programs:

The four graduate courses to be shared by the BS and MS programs are to be taken from a single track of the MS program, and will be part of the MS curriculum. Covering higher level materials, the graduate courses are also suitable substitutions for upper-division electives and required courses for the undergraduate curriculum.

<u>Catalog Description</u>

Combined BS with Major in Mathematics and MS with Major in Applied Mathematics and Statistics

This is an accelerated five-year program where students complete the Bachelor of Science (BS) degree in Mathematics and then continue with the Master of Science (MS) degree in Applied Mathematics and Statistics (AMST).

The combined degree program is 150 credits: 120 credits for the undergraduate degree and 30 for the master's degree, with a maximum of 12 credits of graduate coursework used to satisfy both degrees. Once admitted into the program, students shall follow the suggested course sequences within a single track. The baccalaureate degree will be conferred before the master's degree.

Students must maintain a GPA of 3.0 in upper-division and graduate courses. Students interested in this program should consult with the undergraduate and graduate advisors before taking upper-division mathematics coursework to ensure that their coursework will apply toward the combined degree. Students must take the GRE and apply for admission to candidacy by the end of their junior year.

Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the *Transition Guides.*

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

The B.S. curriculum:

Students must complete the requirements of the B.S. degree in Mathematics. Twelve graduate credits will count toward to both B.S. and M.S. degree requirements. Students must select 12 credits from the graduate courses within a single track.

Applied Analysis Track: four courses from Lists A and B, with at least one from List A		
List A		
Introductory Analysis 1	MAA 5228	3
Linear Algebra	MAS 5145	3
Computational Math	MAD 6403	3
Numerical Analysis	MAD 6407	3
Ordinary Differential Equations	MAP 6336	3
Partial Differential Equation	MAP 6345	3
List B		

Introduction to Data Science	CAP 5786	3
Multivariable Analysis	MAA 5105	3
Introductory Analysis 2	MAA 5229	3
Real Analysis	MAA 6306	3
Complex Analysis 1	MAA 6406	3
Introduction to Functional Analysis	MAA 6506	3
Introduction to Dynamical Systems & Chaos 1	MAP 6211	3
General Topology 1	MTG 6316	3
Regression Analysis	STA 6236	3
Mathematical Statistics	STA 6326	3
Mathematical Probability	STA 6444	3
Applied Time Series Analysis	STA 6857	3

Biostatistics Track: four courses from Lists A and B, with at least one from List A.

List A		
Biostatistics	STA 5195	3
Mathematical Statistics	STA 6326	3
Mathematical Probability	STA 6444	3

List B		
Introduction to Data Science	CAP 5786	3
Multivariable Analysis	MAA 5105	3
Numerical Analysis	MAD 6407	3
Linear Algebra	MAS 5145	3
Statistical Computing	STA 6106	3
Survival Analysis	STA 6177	3
Biostatistics - Longitudinal Data Analysis	STA 6197	3
Applied Statistical Methods	STA 6207	3
Regression Analysis	STA 6236	3
Topics in Probability and Statistics (Stochastic Calculus)	STA 6446	3
Applied Time Series Analysis	STA 6857	3

Cryptology Track: four courses from Lists A and B, with at least one from List A

List A		
Intro to Crypto and Information Security	MAD 5474	3
Cryptanalysis	MAD 6478	3

Coding Theory	MAD 6607	3
List B		
Introductory Analysis 1	MAA 5228	3
Introductory Analysis 2	MAA 5229	3
Enumerative Combinatorics	MAD 6206	3
Graph Theory	MAD 6307	3
Computational Mathematics	MAD 6403	3
Cryptography	MAD 6477	3
Linear Algebra	MAS 5145	3
Introductory Abstract Algebra 1	MAS 5311	3
Introductory Abstract Algebra 2	MAS 5312	3
Algebraic Number Theory	MAS 6215	3
Algebraic Curves	MAS 6315	3
Commutative Algebra	MAS 6333	3
Topics in Algebra (Group Theory)	MAS 6396	3
Special Topics (Elliptic Curves / Computational Group Theory)	MAT 6933	3
Mathematical Statistics	STA 6326	3
Mathematical Probability	STA 6444	3
Financial Mathematics Track: four courses from Lists A and B, with at least one from List A.		
List A		
Introductory Analysis 1	MAA 5228	3
Mathematical Statistics	STA 6326	3
Mathematical Probability	STA 6444	3
List B		
Multivariable Analysis	MAA 5105	3
Introductory Analysis 2	MAA 5229	3
Linear Algebra	MAS 5145	3
Statistical Computing	STA 6106	3
Applied Statistical Methods	STA 6207	3
Regression Analysis	STA 6236	3
Topics in Probability and Statistics (Topics in Stochastic Processes)	STA 6446	3
Topics in Probability and Statistics (Stochastic Calculus)	STA 6446	3
Applied Time Series Analysis	STA 6857	3

Directed Independent Study (Financial Mathematics 1)	STA 6907	3
Directed Independent Study (Financial Mathematics 2)	STA 6907	3

The 12 graduate credits can either be counted as upper-division math electives, or as a substitute for a required course as follows:

MAA 5228 can be used to substitute for MAA 4200
MAA 6406 can be used to substitute for MAA 4402
MAS 5145 can be used to substitute for MAS 4107
MAS 5312 can be used to substitute for MAS 4301

The MS Curriculum:

Students complete all requirements of the MS degree with major in Applied Mathematics and Statistics.